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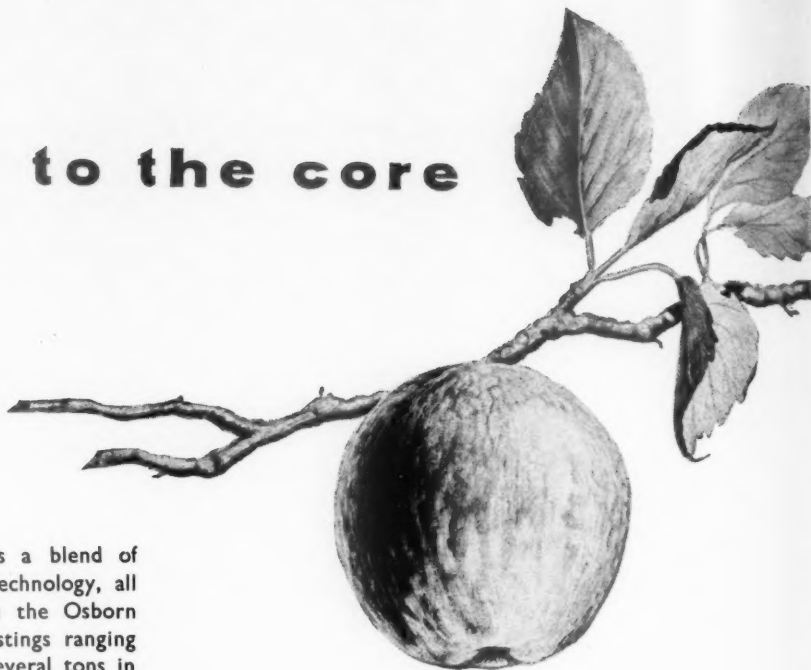
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Abnormal Indivisible Handicap

FOR many years the national road network has been a headache to all users. The reasons for this and the difficulties inherent in improving the position are so well known that their repetition is superfluous. Mr. Harold Watkinson, as an unusually active Minister of Transport & Civil Aviation, has introduced many forceful and ingenious measures designed to control and speed up traffic movement, and it must be admitted that many of these have been successful. Nevertheless, it is difficult to applaud his latest project. His regulations for the use of motorways, to be tried out this year on Preston By-Pass, exclude certain traffic from that road. As the ban covers vehicles carrying abnormal indivisible loads the effect of Mr. Watkinson's proposals is a direct impedance to our export trade. The Minister adds that he will permit a limited number of these vehicles to use the motorway occasionally so that the effect on traffic flow can be observed, but we would suggest that this undertaking, far from constituting a concession, shows a discriminatory attitude. From time to time, abnormal indivisible loads necessarily are despatched by many types of manufacturers, including those engaged in the electrical equipment and locomotive and rolling-stock industries. For many years, industry has transported its products to site or coast under extreme traffic difficulties solved only by close and

willing co-operation with the Ministry of Transport. The advent of the new roads now under construction at vast public expense has been eagerly awaited for a consequent easement in the position. These new roads will not merely consume money and great portions of our already fast-disappearing countryside. They will permit direct and savage competition with the national railway system, already working under severe difficulties of operation and a tight budget which impedes its proper modernisation. It now appears that traffic ideal for rail carriage is to be encouraged, while vehicles carrying out-of-gauge loads impossible to transport by train are to be forbidden, on the new roads. In one stroke, the Minister would penalise railways, manufacturers, and, ultimately, the public which pays for all. His possible achievements are the gratification of general hauliers and the private motorist. Mr. Watkinson has made it clear that the new rules are in force as an experiment only and are not to be regarded as a precedent. This knowledge provides slight grounds for satisfaction: it would be far more pleasing to learn that he has had second thoughts on the matter.

Collective Bargaining by Railway Officers

IN the midst of discussions on wage rates for the rank-and-file of employees, there is a tendency to overlook the hardworking and uncomplaining railway officer. Despite some recent salary increases, officers today are poorly paid compared with those bearing comparable responsibilities in other, and often more prosperous, industries; in the light of present-day prices their salaries compare unfavourably with those obtaining on most railways before nationalisation—with some exceptions, which have been a pretext for restricting augmentations of salary; and the differentials between their pay and that of their subordinates tends to be diminished, as the pay of lower grades is raised as the result of negotiation—or threat to strike. The ethics and practical advantages of collective bargaining for the engineering profession, which includes a minority of railway officers, are reviewed in a report adopted by the Council of the Engineers' Guild and published last week in the July issue of that association's *Journal*. The report deserves careful study. Briefly, it is opposed—and rightly—to collective bargaining as, amongst other things, inconsistent with the obligations of men in authority or of members of a profession. It recommends that the Guild seek and establish a position akin to that of a consultant with employers on the economic interests of engineers. That does not answer the question for most railway officers. Many of them, who are in the categories embraced by the associations—which do not include the Engineers' Guild—officially recognised by the British Transport Commission for purposes of negotiation, feel that their position would be worse but for the collective bargaining by those associations. Others consider the recognised associations to be too much concerned in the pay and conditions of lower grades, and would prefer a freer, bolder policy for officers.

Electrification into Buckinghamshire

AMERSHAM, whither electrification of the Metropolitan Line of London Transport is being extended from Rickmansworth, is likely to remain the terminus of the 600-V. fourth-rail electric service for the foreseeable future. Outer suburban traffic from and to stations at Aylesbury does not justify conversion, and if, as is unlikely, there are plans for conversion of the former Great Central Railway main line at 50 cycles, they must have low priority among British Railways electrification projects. Quadrupling between Harrow-on-the-Hill and Watford South Junction, postponed because of the war, is to be resumed, though some of the work, such as abutments, was completed some time ago. This should improve the punctuality of G.C.R.—now London Midland Region—main-line trains. On the other hand, stations beyond Amersham to Aylesbury inclusive will be served by passenger trains to and from Marylebone only, though there will doubtless be interchange facilities at Harrow.

Doubling a South African Main Line

BLASTING a few days ago caused the headings to meet of one of the twin tunnels being driven through the rock escarpment between Cedara and Boughton, in Natal, on the electrified Pietermaritzburg to Ladysmith section of the South African Railways Durban-Johannesburg main line. Each bore will be $3\frac{1}{4}$ miles long. Both are expected to be ready for traffic by the middle of next year. Their completion, by making possible two tracks between Pietermaritzburg and Ladysmith, will provide in effect a double line from Durban to Ladysmith, and, with other deviation works, will shorten the total distance by some miles, besides easing gradients and curves. The capacity of the through route will be increased from 20,000 to 45,000 tons a day—remarkable figures for a 3-ft. 6-in. gauge railway. From Durban the line is electrified to Volksrust, 308 miles; this leaves 174 miles to be converted onwards to Johannesburg, work on which is understood to be beginning.

Overseas Railway Traffics

EAST African Railways & Harbours approximate railway revenue for June amounted to £1,432,000 compared with £1,411,000 in June, 1957, an increase of £21,000. The total railway revenue for the first six months of 1958 amounted to £9,303,000 compared with £8,529,000 in 1957, an increase of £774,000. With the exception of other coaching traffic which declined by £18,000, there were increases in receipts from all services. Railway operating revenues of the International Railways of Central America for May amounted to \$1,417,185, a decrease of \$16,443 compared with May, 1957. Net income for the month was \$63,759 (\$115,344). Aggregate net revenue from railway operations for the period January 1 to May 31 was \$711,025 (\$1,565,420). Costa Rica Railway receipts for May were colones 2,214,284 compared with colones 1,980,389 for May, 1957, an increase of colones 233,895. Aggregate receipts from July 1, 1957, amounted to colones 21,043,458 (colones 18,125,000). Net railway earnings of the West of India Portuguese Guaranteed Railway Co. Ltd. for the 10-day period ending July 10, 1958, were Rs. 56,914 compared with Rs. 79,064 in the corresponding period in 1957, a decrease of Rs. 22,150.

"The Shires" at St. Pancras

THE first stage of a new development now being carried out at St. Pancras Station by British Transport Hotels & Catering Services has been opened. An illustrated description appears elsewhere in this issue. Deriving its name from the several counties served by the London Midland Region of British Railways, "The Shires" forms a self-contained suite of entrance hall and lobby, lounge bar, and dining room. Kitchen, scullery, and service entrance space is roomy: so is the actual working area of the bar, which possesses a strategically-placed hatch at a point mid-way between lounge and dining room. The entrance hall is part of the clever planning which helps to provide seclusion and eliminate station noise: inside, an exceptionally pleasing décor encourages relaxation. Refreshment available ranges from drinks or beverages and a snack to a full cooked meal with champagne. Prices, though not cheap, are moderate considering the standards achieved: that they cannot be regarded as low does not imply criticism. Because of them, the charm of "The Shires" doubtless will continue to please visitors for far longer than would be the case if a popular tariff were introduced.

The Future of the Canals

THE report of the committee of inquiry, under the chairmanship of Mr. Leslie Bowles, into the nationalised inland waterways, was published earlier this week. The recommendations should go far to reduce the annual deficit of some £300,000 at present being incurred on what the committee terms Class "B," some 930 miles of the

1,300-odd miles of waterway now vested in the British Transport Commission. The report states that the main obstacle to commercial carriage is the fact that craft operating on narrow and often circuitous canals, with many locks, is uneconomical; it advocates rehabilitation of these waterways, maintenance to prescribed standards for 25 years, and abolition of the existing system of tolls. In recommending "an integrated and efficient system of inland navigation" the committee is unanimous, but differs as to the body to which administration should be entrusted. Little can be done until statutory restrictions are removed. The Commission has initiated a £5½-million improvement programme for the 380 miles of remunerative waterways, and has been energetic in securing all possible revenue from its inland water assets. Canal transport, which is complementary to the railways, can play an important part in the national economy, and the Commission is as fit a body as any to be responsible for it, whether as canal owner or boat operator.

New Car-Ferry Steamer

DURING the past five years the number of motorists taking cars across the Channel has increased by nearly 100 per cent. The rise is continuing and the need for more car-ferries has been apparent for some time. The French railway system, which has been associated with its British colleagues on the traffic for almost a century, has made the latest contribution to date (the *Dinard* eventually will be replaced by the *Maid of Kent*, now under construction on the Clyde). The S.N.C.F.'s new steamer *Compiègne*, which increases cross-channel car-ferry accommodation during the summer months by more than 50 per cent, is described on another page. The *Compiègne*, which accommodates 164 cars and 1,000 passengers, plies between Dover and Calais. Two features merit special attention: the embarkation door, which slides upward through a scroll-curve designed to prevent accidental opening, and the "one-way" traffic system, which ensures that the first car on is first off. The *Compiègne* is the eighth French Railways vessel in the combined French and British Railways Channel fleet.

Bag and Baggage

VISITORS from overseas, and some guide books on Britain, have long commented on what they term the haphazard way in which passengers' accompanied baggage is handled by British railways. Habits have changed, and most people today are content to travel with what they can have with them in the carriage; the quantity is not often excessive, and carriage designers spend much time on the problem of adequate rack space. Nevertheless there is an element of uncertainty in travelling when heavy baggage is conveyed in the van. The absence of documentation no doubt increases the risk of theft; and many passengers worry, often needlessly, about transfer at changing points. In practice the arrangement works well, partly because so little accompanied baggage is placed in vans. The luggage-in-advance facility is useful at peak holiday travel periods. The importance of handling such baggage efficiently is rightly stressed by "The Man on the Line" in a recent issue of *British Railways Magazine*; these consignments, he points out, represent revenue from fares besides the luggage-in-advance payments.

Free Portage

IT is doubtful whether most people in this country would welcome the formalities associated with baggage registration as in force on the Continent, nor whether they would wish to be parted from their light baggage as they often must be when travelling by air. For cross-Channel journeys, however, there is much to be said for some arrangement for transfer at ports without the present necessity for tips to porters. This latter is additional to the need to pay for refreshments en route. The combined expenditure, which can be heavy, compares unfavourably with the free refreshments—but not neces-

sarily full meals—provided on air journeys and the free transfer of baggage at airports and at some city air terminals. It is often a reason for deciding to travel by air instead of by train and boat. In Australia there is free baggage transfer at break-of-gauge stations on inter-State railway journeys, whilst the passenger has access to his suitcase, for instance, in the compartment before and afterwards. Something of this kind might be devised for surface journeys between Great Britain and the Continent and Ireland.

Signalling for A.C. Electrification

THE adoption of the 50-cycle system of electrification on British Railways has necessitated, as elsewhere, much investigation into the signalling and telecommunication equipment best suited to give security against irregular functioning of apparatus, induced voltage, and other adverse effects. As briefly described elsewhere in this issue, a completely re-signalled section, $9\frac{1}{2}$ miles long, has now been put into service between Wilmslow and Slade Lane Junction, on the Crewe-Manchester line of the London Midland Region, designed to meet these requirements and also to form part of a larger scheme, when work authorised at Manchester London Road has been completed. The signal controls, track circuits, remote controls for the intermediate relay interlocking locations, with carrier and transitorised equipment operating on the scanning principle over a minimum of wires, point operating apparatus, and other equipment, represent the latest progress in signalling technology. This particular work marks the beginning of one of the most important aspects of the British Railways modernisation plan.

Power: Weight Ratios

SOME comparison between the various designs of diesels, ordered by the British Transport Commission—the choice of transmission, power:weight ratios and so on—will inevitably be made as the first of each design is delivered. Indeed the Commission stated that the purpose of ordering so many prototypes, in 1955, was to allow comparisons of performance in service before deciding on standard designs. An easy comparison is of the power:weight ratios; this is often used by advocates of certain features, such as the type of engine or transmission, which can result in weight saving, to show the relative merits of the equipment or system they favour. That the achievement of good power:weight ratios is not achieved solely by any one form of transmission, electric or hydraulic, has been shown by some recent main-line designs using both systems with ratios of around 70-80 lb. per b.h.p. Some maintain that for locomotives designed for other than main-line duties a case can be argued for following conventional construction practice and for electrical equipment with medium-speed engines, and that comparison merely on the basis of power:weight ratios might be misleading. From a power:train weight comparison, for example, any differences are narrowed considerably. If, however, a good power:weight ratio is desirable, as we believe, it is to be hoped that there will be a wider realisation of its importance, and also the practicality of attaining it with good designs.

Greater Variety of Beyer Peacock Locomotives

THROUGH the recent formation of Beyer Peacock (Hymek) Limited, all the three major transmission systems for diesel locomotives can now be undertaken by Beyer Peacock, additional to the existing comprehensive range of motive power for railways all over the world, including, in the still important field of steam, the Beyer-Garratt. In view of the increasing interest taken by all managements, and not least by those of railways in rapidly developing territories overseas, in diesel traction, the greater choice of motive power obtainable from these builders should greatly augment locomotive exports from Britain. The purpose of the new company is stated to be to unite the resources of Beyer Peacock, Armstrong

Siddeley, and the Brush Group for the supply of the new type of power. Diesel-hydraulic locomotives from the new company will primarily incorporate the Maybach engine made under licence by Armstrong Siddeley, with which firm Beyer Peacock has equal holdings in Hymek. The Mekydro hydraulic transmission, to be constructed in this country under licence by J. Stone & Co. Ltd., will be available, and other combinations of engine and drive can be embodied. The manufacture of the locomotives will normally be undertaken by Beyer Peacock at its Gorton, Manchester, works.

Commercial Traffic over the N.W. Frontier

THE many miles of railway built up to and adjoining the North-West Frontier of the Indian Empire were constructed almost entirely for strategic purposes. All formed part of the former North Western Railway of India, the greater portion of which, including all the North-West Frontier lines, is now the North Western Railway of Pakistan. Some of them, notably the line from Quetta to Bostan and onwards through the Khojak Tunnel to Chaman, near the Afghanistan border, and the 500-mile extension from Nushki, through Baluchistan, to Zahidan (Duzdab), in Persia, built during the war of 1914-18, have at times conveyed a certain amount of commercial traffic, notably fruit from Chaman to towns in the plains; the Zahidan extension during the last war conveyed large quantities of supplies from Karachi to Zahidan, whence they were moved by road to railheads in Central Asia for onwards movement to destinations in U.S.S.R. It is safe to say, however, that none of these lines, all of which involved heavy civil engineer works, would have been built as commercial ventures.

The Chaman line is now to be put to more intensive commercial use under an agreement signed last week between Pakistan and the U.S.A. This is part of a programme to improve transit facilities between Afghanistan and Pakistan, and involves development of the 5-ft. 6-in. gauge lines of the N.W.R. from Chaman via Quetta, Sibi, Habibkot, and Dadu to Kotri, where the route joins the main line from Lahore to Karachi. The lines concerned are thought to be incapable of conveying the amount of import and export traffic expected to be shipped via Karachi.

The Government of the United States accordingly has agreed to make available to Pakistan a total grant of \$7,708,000 (Rs. 3,66,13,000) plus U.S. counterpart money in the amount of Rs. 83,64,750. The North Western Railway will be provided with funds to: (a) extend the railway from Chaman to Spin Baldak, on the Pakistan-Afghanistan border and provide an exchange yard for making and taking over the wagons between Afghanistan and Pakistan; (b) buy 11 new diesel locomotives and about 500 new goods wagons, including tankers; (c) install automatic block signalling on the main line from Karachi to Landhi, 15 miles; (d) build a new marshalling yard at Karachi; and (e) improve track and layout, bridges, and other structures from Chaman to Kotri. Technical assistance is to be provided by the American authorities in establishing the necessary transit facilities and simplifying Customs procedures in the port of Karachi and at the Pakistan/Afghanistan frontier station, and a road is to be built in Afghanistan from the railhead at Spin Baldak to Kabul via Kandahar.

In view of American interest in Pakistan and contiguous countries as markets and sources of oil, and for strategic reasons, the development of the Chaman route may be regarded as a small beginning. It offers scope for British manufacturers of railway material, but further projects which have been discussed, such as increasing capacity of the Zahidan line, and building a new line north-westwards from Karachi to open up Baluchistan, now seem likely to be put in hand in the not too distant future. Railway development in Pakistan hitherto has been largely confined to rehabilitation, though much has been done to improve and to add to motive power and rolling stock, and some branches have been built.

Fatal Derailment in Jamaica

THE first railway in Jamaica, and the earliest in the British Empire overseas, was opened in 1845 by a private company. It was bought by the Government in 1879 but, with certain extensions, was sold to a company in 1890. The new owners also extended the system, but could not make the railway pay, and in 1900 the undertaking reverted to the Government. The system has since been extended, and today covers a little over 200 route-miles, all single line of standard gauge. There are many steep inclines, some of them long, and many sharp curves. No passenger was killed in an accident until July 30, 1938, when a train, assisted by a banking engine, became derailed on a curve from excessive speed, with 32 fatalities, after which the use of banking engines was prohibited. A special commission was appointed to investigate the case, as reported in our issue of July 21, 1939. In 1944, a goods train got out of control on an incline with grave results.

The railway remained free from serious accidents until September 1, 1957, when an overcrowded 12-coach excursion, carrying 1,500-1,800 passengers, ran at too high a speed on a 1 in 30 gradient; the leading vehicle overturned at a curve and the greater part of the train was wrecked. The two diesel-electric locomotives ran on for some 440 yd. It was about 11.15 at night, which made rescue work very difficult; this, however, was organised with great effectiveness by the various authorities, with much private help, and the clearing of the line was commendably quick; a local firm lent equipment to cut a road to the site. The number of casualties could not be ascertained with absolute certainty, but the fatalities finally were estimated at about 190, while over 1,000 persons were injured.

A commission of three was appointed by the Acting Governor to inquire into the accident, and given authority to summon one or more expert advisers to assist its deliberations; the members invited Brigadier C. A. Langley, the present Chief Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, to sit with them as assessor and he arrived in Jamaica on September 8. He presented his very comprehensive report to the commissioners under date of January 13, 1958, in the form used in the case of accidents in Great Britain. In view of the complexity of the case, this represents expeditious work. The commissioners' own report is to the Governor, Sir Kenneth Blackburne, and is dated February 10. Both reports have now been made public.

Fifty-nine witnesses were heard, of whom 37 travelled on the train, and further statements, collected by the police, considered. Brigadier Langley conducted investigations on site and along the line, and carried out experiments with a complete train and items of equipment, some in the workshops. These enabled him to discover the reason for the driver losing control of the train at the approach to the point of derailment but not earlier. A train pipe angle cock, parts of which were worn and which was fixed incorrectly, as some others were found to be, and near enough to become struck on sharp curves by the central coupling mechanism, had become closed during the running, depriving the driver of control over the brakes on 10 of the 12 vehicles. The guard and one brakeman, contrary to their duty, were on the engine and so unable to assist by applying the train brakes, nor did either of the other brakemen do so when speed became excessive.

The commissioners praise the thoroughness with which Brigadier Langley investigated the case and observe that "had it not been for his persistence in conducting these enquiries it might well have been that we may not have discovered the cause of the failure of the brakes. We cannot express too strongly our appreciation of the services he has rendered, not only to the commission in making its enquiries but also to the Management of the Jamaica Government Railway for the very thorough examination he has made into its working, particularly in relation to the safety of trains and condition of the brake equipment."

The immediate cause, therefore, was loss of brake power, brought about accidentally as explained; but the investigations brought to light many other things, often reflecting unfavourably on the operating and engineering depart-

ments. It revealed indiscipline, lack of initiative, want of effective supervision, and connivance at irregular practices in brake testing, inspection and other matters, to the point even of the creation of false documents.

Brigadier Langley made 10 recommendations, which the commissioners adopted and supplemented to cover matters such as the validity of the rules, on which doubt had been cast, and more thorough and regular examination of staff. A reorganisation of both managerial and traffic departments is called for and the strengthening of the mechanical engineering section, the under-staffing of which was reflected in the condition of some of the brake equipment, bound to lead to serious consequences sooner or later. One important technical recommendation is that the present arrangement of retaining valves, which have to be set by guards and brakemen before steep inclines are negotiated, should be abandoned and straight air brake equipment added to the automatic, with improved emergency valves on the coaches; in addition there should be a penalty for improper use, as met with elsewhere, as the existing design is liable to cause damage if interfered with by passengers. Pending the elimination of stock with wooden bodies, the length of trains is recommended to be strictly limited and, in any case, the number of persons permitted to travel standing.

Energetic steps, it is understood, are being taken to implement the recommendations from these very thorough investigations and establish a proper sense of responsibility and state of discipline. Under its new General Manager, Colonel R. G. Jackson, the Jamaica Government Railway can start fair with an opportunity once more of providing safe and efficient service.

Penultimate G.N.R. Report

DISSOLUTION on October 1 next of the Great Northern Railway Board and partition of the assets between Coras Iompair Eireann and the Ulster Transport Authority means that the Board's report for the year ended September 30, 1957, is the last but one. It is the penultimate of a long series, if the Board be considered as successor to the board of the Great Northern Railway Company, from which the undertaking was bought in 1953. The report is signed by two Senior Members, Mr. A. P. Reynolds, the Chairman, appointed by the Minister for Industry & Commerce for the Republic of Ireland, and Mr. G. B. Howden, appointed by the Minister of Commerce for Northern Ireland; Mr. Howden is also Chairman of U.T.A.

In view of the uncertain and indeed unpromising future of the railway as it has appeared for some time past, it is not surprising that no steps were taken in 1956-57 to implement the comprehensive proposals for modernising the undertaking which had been submitted to both Governments in November, 1954, except in the provision of additional railcars. Reference is made in the report to the decision to terminate all train service on the Omagh—Enniskillen—Clones and Portadown—Armagh—Glaslough lines and on the Bundoran, Fintona, and Keady branches. The length of these lines is 115 miles, or about one-quarter of the total mileage of the system. In consequence of the decision to terminate the services on these lines, the position as to connecting lines in the Republic of Ireland had to be considered: Dundalk—Castleblayney—Clones; Cavan—Clones—Monaghan—Glaslough and the Bel-turbet and Carrickmacross branches. The length of these lines is 84 miles, or 38 per cent of the total G.N.R. mileage in the Republic. In view of the resultant position of the cross-border sections of these lines the Board decided to terminate on September 30, 1957, all railway passenger services on the above mentioned lines in the Republic, and to operate freight traffic only for an experimental period. This decision was duly put into effect, leaving the present truncated system to be partitioned. The Northern Ireland Minister of Commerce in June, 1957, announced his intention to give notice terminating on September 30, 1958, the statutory agreement of 1953 between the Governments under which the Board was established, while stating that the Portadown to Londonderry line

could not long remain open. It is believed that the Northern Government intends to close the line shortly. A curtailment of the volume of work required to be carried out at the Dundalk Works, in Republic territory, also was involved by these decisions. As a consequence negotiations began towards the end of the year for leasing the workshops to a new company set up by the Minister of Industry & Commerce which would carry out such work as was required by the Board.

The new railcar depot at Fairview begun in 1955 was completed and brought into use on April 1, 1957; all the railcars in the Dublin area are now serviced here. Delivery of the chassis and structural sections of the bodies of 24 additional railcars, the construction of which was undertaken in the Dundalk Workshops, began in September, 1956, and the first three completed cars were ready for service in June, 1957. By the end of the year eight cars were in service, and the programme will be completed by October, 1958. The cars were described in our issue of June 7, 1957. Alterations to 24 existing carriages of the most suitable type to enable them to work as intermediate coaches with the new railcars proceeded simultaneously with the building of the cars, and eight such carriages were converted during the 12 months. The railcars displaced steam on the Dublin-Belfast "Enterprise" express services. The through passenger services between Belfast and Londonderry have been operated entirely by railcars since October 1, 1957, resulting in accelerated timings and better connections, besides a considerable reduction in operating costs.

	£	Total	Apportionment	
			Minister for Industry & Commerce, Dublin	Ulster Transport Authority
Railways				
Gross receipts	2,893,790			
Working expenses	3,633,308	(Dr.) 739,518	(Dr.) 256,650	(Dr.) 482,868
Hotels and catering	(Dr.) 2,266	(Dr.) 1,456	(Dr.) 810
Road passenger	(Cr.) 34,295	(Cr.) 34,295	—
Road freight	(Cr.) 47,730	(Cr.) 47,730	—
Hewth Tramway	(Dr.) 11,969	(Dr.) 11,969	—
Balance on working accounts	(Dr.) 671,728	(Dr.) 188,050	(Dr.) 483,678
Joint lines Co. Donegal	(Dr.) 10,892	(Dr.) 8,108	(Dr.) 2,784
Railways Jt. Ctte.	(Cr.) 22,545	(Cr.) 7,207	(Cr.) 15,338
Miscellaneous receipts			
Balance (after adjustments for interest receivable and payment, and rentals and other fixed charges, etc.)	(Dr.) 1,081,748	(Dr.) 389,589	(Dr.) 692,159
Balance forward from previous year	(Dr.) 2,877,188	(Dr.) 1,049,073	(Dr.) 1,828,115
Balance carried to balance sheet	(Dr.) 3,958,936	(Dr.) 1,438,662	(Dr.) 2,520,274
Route-miles open, rail	525		
Passenger journeys, rail	8,474,303		
Freight tonnage, rail (tons)	976,345		
Passenger journeys, road	11,282,699		
Freight tonnage, road (tons)	297,350 (excl. livestock)		

There was no replacement of steam locomotives during the year, but 20 over-age locomotives and 16 over-age tenders beyond economical repair were scrapped. There was a reduction in heavy repairs carried out in Dundalk Works compared with the previous year, as each heavy repair involved a good deal more work because of the bad condition of the locomotives, particularly boilers for which interchange units were not available. The shortage of large-type goods engines resulted in some goods trains having to be worked by the smaller-type locomotives and, therefore, requiring assistance from banking or pilot engines; such working, the report observes, is far from economical. No new ordinary carriages were built during the year.

Working for the financial year under review resulted in a trading loss of £658,048, to which must be added interest on capital, temporary advances and borrowings amounting to £423,700, making the total loss £1,081,748, a reduction of £96,139 compared with the previous year. The trading loss shows a reduction of £173,237, due to an

improvement in railway and road passenger receipts, with a reduction in expenditure on maintenance and renewals.

The volume of passenger traffic, compared with the previous year improved by 9½ per cent on the railway and about 5½ per cent on the road side, while the corresponding revenue was about 4 per cent greater overall, caused almost entirely by restrictions in supplies of petrol in consequence of the Suez incident. With freight there was a considerable falling off in the volume of traffic and in the receipts, both on the railway and on the road services. This was due principally to a considerable reduction in cement traffic. On the other hand there was an increase in cattle traffic which, on the railway increased by 64 per cent and by about 132 per cent on the road services. The threat of closing the secondary lines and branches after September 30, 1957, had a marked effect on the railway freight traffic.

There was a number of incidents of malicious damage to railway property and equipment in Northern Ireland which resulted in the disruption of services and in some cases substitute road services had to be provided.

British Transport Commission Traffic Receipts

BRITISH RAILWAYS merchandise, mineral and coal class traffics continue below those of last year. For the seventh four-week period of 1958, that ended July 13, merchandise and livestock traffic at £7,070,000 is £536,000 below the corresponding figure for last year. The reason seems to be the fall in the traffic potential. The total freight receipts for this period from the other British Transport Commission carrying activities, inland waterways, road haulage, and ships, also show a decline compared with 1957, from £4,464,000 to £4,408,000. In view of reduced steel production, British Railways mineral traffic receipts at £3,240,000, compared with £3,897,000 for the corresponding four weeks of last year, were to be expected, and are much the same as for the preceding period.

By June of last year, British Railways freight traffic had fallen to its natural level, after the additional flow caused by the fuel oil shortage resulting from the Suez incident. The total railway freight receipts for Period 7 of the current year at £24,317,000 make a poor showing against £25,574,000 for last year—which itself represents a drop compared with £26,364,000 for the corresponding four-week period of 1956.

	Four weeks to July 13, 1958		Incr. or decr.	Aggregate for 28 weeks		Incr. or decr.
	1958	1957		1958	1957	
Passengers—	£000	£000	£000	£000	£000	£000
British Railways	12,949	12,896	+ 53	70,336	72,496	— 2,160
London Transport:						
Railways	1,845	1,676	+ 169	13,235	12,572	+ 663
Road services	3,274	4,582	— 1,308	23,137	32,301	— 9,164
Provincial & Scottish buses	5,262	5,231	+ 31	30,890	31,641	— 751
Ships	868	892	+ 24	2,917	2,904	+ 13
Total Passengers	24,198	25,277	— 1,079	140,515	151,914	— 11,399
Freight, Parcels & Mails—						
British Railways:						
Merchandise & livestock	7,070	7,606	— 536	51,607	59,941	— 8,334
Minerals	3,240	3,897	— 657	25,802	28,934	— 3,132
Coal & coke	9,057	9,204	— 147	70,736	69,434	+ 1,302
Parcels, etc., by passenger train	3,998	3,851	+ 147	27,647	26,884	+ 763
Collection & delivery, etc.	952	1,016	— 64	6,732	7,325	— 593
Total freight British Railways	24,317	25,574	— 1,257	182,524	192,518	— 9,994
Others*	4,408	4,464	— 56	29,488	29,616	— 128
Total Freight, Parcels & Mails	28,725	30,038	— 1,313	212,012	222,134	— 10,122
Total	52,923	55,315	— 2,392	352,527	374,048	— 21,521

* Inland waterways, freight, road haulage, and ships

Period 7 includes the beginning of the holiday traffic season. In view of the efforts made to improve services, including introduction of diesel railcars which have

markedly improved receipts in some instances, British Railways passenger traffic receipts at £12,949,000 are disappointing, as only slightly exceeding last year's figure of £12,896,000, and indeed the 1956 total of £12,125,000 despite fare increases in the meantime. No true comparison between London Transport bus receipts for the current year and 1957 is possible, as the bus strike continued into the first few days of Period 7.

PERCENTAGE VARIATION 1958 COMPARED WITH 1957		Four weeks to July 13	28 weeks to July 13
<i>British Railways—</i>			
Passengers		+ 0.4	+ 2.9
Parcels		+ 3.8	+ 2.8
Merchandise & livestock		- 7.0	- 13.9
Minerals		- 16.8	- 10.8
Coal & coke		- 1.5	+ 1.8
C. & D. services		- 6.2	- 8.0
Total		- 3.1	- 4.5
<i>Ships (passengers)</i>			
		- 2.6	+ 0.4
<i>British Road Services, Inland Waterways & Ships (cargo)</i>			
		- 1.2	- 0.4
<i>Road Passenger Transport, Provincial & Scottish</i>			
		+ 0.5	- 2.3
<i>London Transport—</i>			
Railways		+ 10.0	+ 5.2
Road services		- 28.0	- 28.0
Total		- 18.0	- 18.0
Aggregate		- 4.3	- 5.7

Renewal of Pin-truss Pins under Traffic

A PROBLEM likely to be encountered by railway administrations in different countries is the rehabilitation of old pin-connected trusses of bridges. This type of work along with other repairs and strengthening has recently been carried out on the 60-year-old Mississippi River bridge on the double-track main line of the Chicago, Rock Island & Pacific Railroad. It is an 1,850-ft. long structure consisting of eight spans—including a swing span—carrying 30 or more trains a day and a 24-ft. roadway below the rail deck. Thirty of the most-worn pins varying in dia. from 6 in. to 9 in. were replaced by new ones of from 6½ in. to 10-in. dia. The old pins had grooves worn in them up to ¼ in. deep and the pin-holes before reboring were correspondingly worn. The total cost of the repairs was about £600,000, the work being carried out under traffic.

As the density of rail traffic did not allow the replacement of a pin between trains, falsework trestles carried on steel H-piles driven 4 in. into the rock of the river bed were used to support the pin-joints. Round each joint a "spidering" frame was bolted to the truss members to form a temporary gusset holding all the members in position whilst the pin-holes were being rebored. The high-strength bolts used were left loose until after jacking up from the falsework and centring to no-load position. The falsework, spidering and all other measures were duly tested under trains before the pins were removed. Each old pin was removed by burning into four or more pieces. A special type of boring machine was used driven by electric motor through gearing and a 6-ft. × 2½ in. cutting bar. Each hole was thus enlarged about ¼ in. at a cut, the final maximum permissible clearance between the new pin and the hole being ⅛ in. A temporary pin was used in a partly-bored hole if a train had to be passed during boring. Two sets of spidering designed to suit the types of hole to be rebored and their surrounding members, and three sets of boring-bar equipment were used for this work.

After the reboring and pin-replacement were complete, the main truss eye-bars were tightened up. They had in course of time become so loose as to be totally or partly ineffective. Those fitted with turnbuckles were adjusted comparatively easily, but nine not so fitted were shortened as follows. A 1-ft. length of each was heated to about 1,600° F. with acetylene torches, and clamps gripping the eye-bar on both sides of the heated length were drawn together with tension bars. After cooling, the eye-bars were found to bear tightly on the pins at both ends. In

addition to these works, repairs were carried out to strengthen the end-posts and top chords—including replacement of the lateral bracing of the latter—and also the road-deck stringers and floor-beams. Another heavy job with falsework was the re-fixing of the loose bed-blocks under the span adjacent to the swing-span, which had allowed the end of the span to move outwards and bind on the end of the swing-span. The schedule of one train had to be slightly altered to give a six-hour occupation, otherwise the whole work was carried out without interference with traffic.

Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

Motive Power Policy

July 28

SIR,—In reply to Mr. J. B. Latham, who suggests in his letter published in your issue of July 25 that British Railways should build or convert locomotives to burn small coal instead of increasing their fleet of diesel locomotives: neither the expected surplus of small coal to which your correspondent refers, nor means of burning it more efficiently, detract in our opinion from the essential advantages of diesel and electric traction. These include greater availability, so that a much smaller locomotive stock is needed; economies in manpower; and further improvement in travel standards and in amenities such as cleanliness. As regards oil fuel supplies, even when the railway modernisation programme is fully operative, railway requirements will represent only a very small proportion indeed of the country's total consumption of oil and petrol.

Yours faithfully,

J. H. BRENNER
Public Relations Adviser

British Transport Commission,
222, Marylebone Road, N.W.1

Coded Track Circuits

July 28

SIR,—It was an Interstate Commerce Commission Order that directed American railroads in 1922 to adopt coded track circuits, and so convey a constant cab signal to the engine crew. One of the first railway companies to put this order into effect was the Pennsylvania; it was completed on that system's main lines in July, 1923, and has since been carried out on the other running lines.

We do have coded tracks in this country, but only in regard to intermediate block signals, and in automatic signalling areas. Whilst I am proud of the achievements of the old G.W.R. in this direction, it is apparent to any signalman that such a system would not have prevented the Lewisham disaster; but coded track circuiting to enable a driver to have an audible and visual indication in the cab would have done so.

I am astonished that such a system has not been adopted in this country, especially where multi-aspect signals are in operation. The benefits of such a system are enormous. Besides detecting broken rails and other hazards, it immediately shows the presence of vehicles in the forward section. Where the meaning of a signal is likely to change from a caution signal to a stop signal, as would be the case in a multi-aspect area, there is no existing A.T.C. system in this country that can be applied to operate a warning to the driver.

As a practical railwayman, am I to believe that such a system has been unknown to the management? If so, then I will gladly supply the details. But if not, then why is not the management of British Railways asked by H.M. Inspector of Railways to explain the absence of these essential features?

Yours faithfully,

C. P. LOVEMORE

13, Elliston Road, Redland, Bristol, 6

THE SCRAP HEAP

More Broadcasts About Railways?

With so many programmes devoted to all kinds of sport and other matters of general interest, why is it that there are never any programmes on railway matters? There are hundreds of people of all ages, classes, and professions whose interests and hobbies are centred on locomotives, trains, and the general running of railways who are never catered for.—*Letter to "The Radio Times."*

The Midland & Great Northern Line

For some 50 miles [the M.G.N.] runs over the fertile Fen plain, and here was trade that summer and winter sent trains rolling away over the dikes and drains bearing tulips and broccoli, cabbages and daffodils, strawberries and currants, and the diamonds of the black soil, potatoes. From South Lynn you pass through "King's Country," heather and pines and houses of ruddy local stone. "Hillington for Sandringham," says a station sign with a broad hint, hoping no doubt that one day a princeling would entrain not at Liverpool Street but at Kings Cross; perhaps one did; but the Royal themselves travelled Great Eastern and went to Wolferton when they came to Norfolk.

Away eastward the line crosses good farming land to Melton Constable. The "Crewe of North Norfolk" the wags

have called it; but it was scarcely that, for though they built locomotives there in happier days, and all around is unmellowed railway brick, Melton was never a railway town like Doncaster or Swindon. From the main platforms at Melton you can still hear the Burgh Parva cows at milking time, and the marshalling yards end in meadowland . . . and so at length to Norwich and City Station, "the cathedral of the M.G.N. where a great bell tolled before the departure of trains."—*From "The Times."*

On the Reading Railway System?

Observing that Americans average 243 hours a year travelling to and from their jobs, the *Philadelphia Daily News* has stated:

"That's a lot of time—and most of us spend it watching traffic. We needn't be as old as our grandparents to recall when these were bonus hours. This was before the era of personal transportation, which made every man a chauffeur. People rode the trains.

"But the train, in the pre-automobile era, was an educational force comparable to the Chautauqua. It was literally a poor man's college on wheels. Passengers were agreeably occupied with their own devices because only the engineer was required to keep his eyes on traffic. . . . We know a man who

became adept in reading French through studies pursued on trains. Another acquaintance read all the books on Dr. Eliot's famous five-foot shelf. . . . Ride a train now and then, and catch up on your reading."

Modernisation Pros and Cons

The law of balance still insists,

As progress marches on,
That every glittering, gleaming pro
Should have its gloomy con;
And many a pleasant hour can pass

In shrewd prognostication

About the ultimate results

Of rail modernisation.

In higher circles optimism

Should and must prevail,

But what's in store is not so clear

Much lower down the scale.

No longer will the lineside lads

Ensure their coal supply

By making hideous faces at

The drivers passing by;

Think, too, of anguished, ancient hearts,

When frosts come, quick and cruel;

With wooden sleeper stocks all gone,

How will they fare for fuel?

But, doubtless, all things will work out

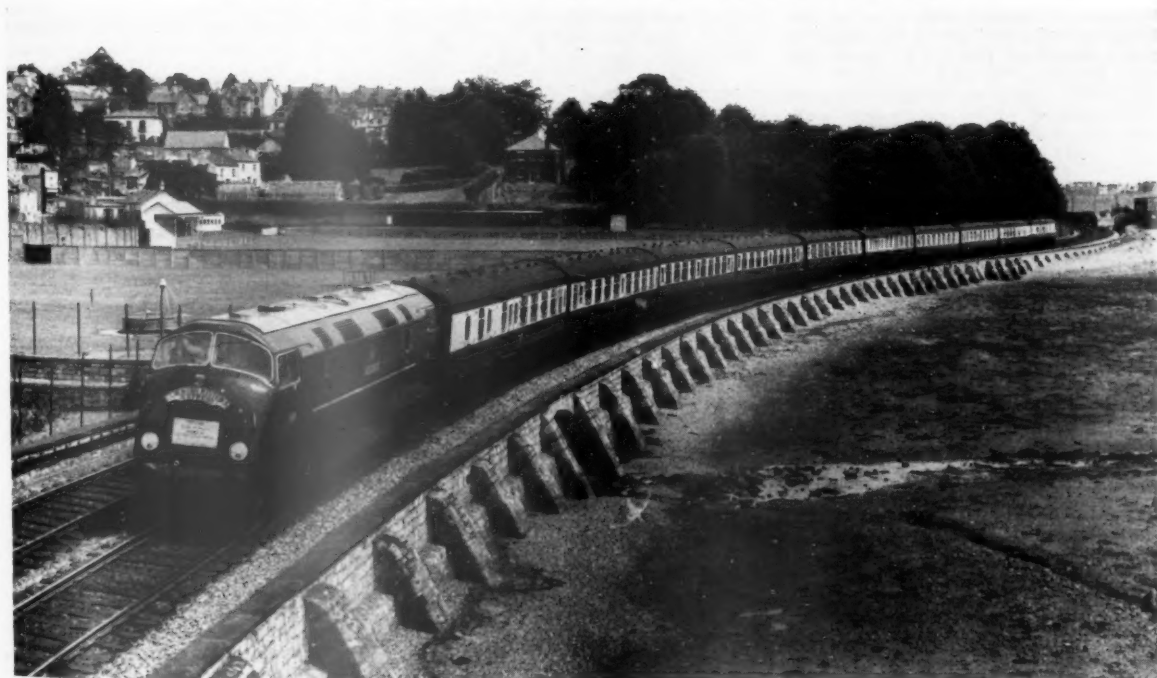
O.K. in the long run

And we'll have more efficiency—

But shall we have such fun?

A. B.

"Cornish Riviera" Headed by Diesel-Hydraulic Locomotive



Western Region down "Cornish Riviera Express" near Teignmouth on July 15, hauled by Swindon-built Type "4" diesel-hydraulic B-B locomotive No. D.800, "Sir Brian Robertson" (see our July 18 issue)

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Improvements at Livingstone

The Livingstone station area is to be remodelled at a cost of more than £500,000. It has long been apparent that major improvements would have to be made at Livingstone, where northbound traffic was just under 700,000 tons in the first half of 1952 and more than 1,200,000 tons for the period January to June, 1957.

Apart from the increase in traffic passing through the yard the existing arrangements are inadequate in other ways. Southbound goods trains have to be marshalled in two parts and coupled by a special shunting movement immediately before departure. The longest train now permitted to leave Livingstone in the direction of Wankie is equivalent to 33 bogie wagons.

The new yard will make proper provision for up and down line traffic and southbound goods trains will be able to leave for Wankie with the equivalent of 41 bogie trucks.

Many more Beyer-Garratt locomotives are now based at Livingstone. The old, long, and narrow locomotive shed is too small for them and will be demolished. It is to be replaced by a motive power depot and carriage and wagon depot.

Other improvements include a coaling plant and modifications to signalling and telecommunications. A new teleprinter and telegraph office, automatic telephone exchange, and a signal and telegraph workshop are to be housed in a new building. The C.T.C. panel con-

trolling the main line train movements on either side of Livingstone will be contained in this building. Implementation of the scheme involves moving the works yard and stores. They are to be rebuilt on the station side of the line.

The scheme will take about three years to complete and the plans allow for further expansion as the traffic increases.

INDIA

Increasing Line Capacity on N.F.R.

Provision has been made for doubling the North East Frontier Railway line between Katihar and Barsoi, but a new line has been proposed as an alternative, between Kumedpur on the Katihar-Singabadi section, and Barsoi. Additional running loops are to be put in at several stations, and new crossing stations built between Barsoi and Sili-guri and on the Assam Link line eastwards to Alipur Duar, and beyond that junction to Amingaon, also on the other bank of the Brahmaputra between Pandu and Tinsukia.

New Works on Southern Railway

Of the 39 miles to be doubled on the north-east section of the Southern Railway between Bezwada and Bitragunta, work on 12½ miles has already been completed and that on the rest is in hand. Due mainly to non-receipt of permanent way materials, the work has not progressed as anticipated. Girders are still awaited for bridges that have to be built on the double line alignment. On the south-

west line, doubling of 39½ miles of track on the Arkonam-Jalarpur-Tirupattur section has been taken in hand.

The first stage of the remodelling of Raichur station was completed during the first year of the Second Five-Year Plan and the holding capacity of the yard has thereby increased from 450 to 744 wagons. Remodelling of the Bezwada, Rajahmundry and Tenali yards is in progress. The metre-gauge yard at Guntakal is also being remodelled and the work is progressing satisfactorily. The work at Tiruvavur is nearing completion.

Other important works completed include provision of additional marshalling and sorting lines at Shencottah and Jalarpur, improved transshipment facilities at Guntakal and Trichinopoly, and augmentation of terminal facilities at Salt Cotaurs (Madras) and Trivandrum Central to permit quicker release of loads.

VICTORIA

Overpass at Corio

Work has started on the construction of an overpass to carry traffic on the Melbourne-Geelong road over the main railway line where there is at present an unprotected level crossing near Corio, about six miles from Geelong. This is one of the six unprotected country level crossings subject to both heavy rail and road traffic which was decided should be abolished some years ago, as circumstances permitted.

Standard-Gauge Line

Work is reported to be getting well under way on the 4-ft. 8½-in. gauge line from Albury to Melbourne. Another 150 men a month are being engaged until the work force for this project reaches 1,500. At the end of last month the total employed was 500.

CANADA

Royal Train

During her tour of Central Canada and the Maritimes, Princess Margaret is occupying two railway coaches which have come to be known as the Royal Family cars. They form part of an 11-coach Canadian National Railways Royal train, recently reconditioned at the C.N.R. Point St. Charles shops, Montreal.

The Royal Family cars were used in 1939 by King George VI and Queen Elizabeth and in 1951 by the present Queen when she toured Canada as Princess Elizabeth. They are normally used by the Governor General, Mr. Vincent Massey.

The rear vehicle of the Royal Train incorporates the personal suite for the Princess, and an observation lounge and

Automatically-Operated Freight Yard for C.N.R.



Canadian National Railways marshalling yard under construction at Côte de Liesse Boulevard, Montreal. The yard will be automatically operated and will deal with up to 7,000 wagons a day. It is due for completion in 1961

bedrooms for her ladies-in-waiting. The train, which will cover some 2,000 miles on the tour, is hauled by three C.N.R. passenger road diesel locomotives, coupled to provide a cab at either end and so obviating the necessity for turning the locomotives en route. All the coaches are equipped with roller bearings and the eight passenger-carrying vehicles are air-conditioned.

"Piggyback" Extended to Maritimes

Canadian National Railway's "piggyback" trailers are now running between Central Canada and the Maritime Provinces. The service operates daily between Montreal, Toronto, Hamilton, and London on the one hand, and 12 points in New Brunswick and Nova Scotia on the other. The service has been expanded frequently to serve new points, and will soon cover additional Maritime centres.

Only railway-owned equipment will be used in the Maritimes and 25 36-ft. trailers have been bought for the new service. Special loading and unloading facilities are being constructed at Halifax, Moncton, and St. John. Transport will be co-ordinated at these centres with the extensive road services already operated in the Maritimes by the C.N.R.

ARGENTINA

Labour Troubles

Partial strikes of signalmen completely disrupted railway services on several occasions in the latter part of June. To rectify what was termed "an injustice" in scales of pay, they staged partial stoppages of 2 hr. a shift, with consequent disorganisation of train services. The Union Ferroviaria denounced the strike, as negotiations were under way, the management had promised that any increases would be retrospective. The matter was finally settled with establishment of new pay scales. Passengers in some of the trains affected rioted, damaging rolling stock.

Publications Received

Recueil des Termes concernant l'Emploi et l'Echange du Matériel Roulant (Dictionary of Terms relating to the Use and Interchange of Rolling Stock) Vol. 1. Warsaw: Published by the Polish Ministry of Communications on behalf of the International Union of Railways (Paris), 8½ in. x 6 in. 629 pp. —This dictionary in six languages—English, French, German, Italian, Polish, and Russian—is a welcome addition to the useful works issued by, or under the auspices of, the U.I.C. Their compilation involves a great deal of labour and there must be imperfections and omissions necessarily in a first edition. If, however, users bring any such they encounter when using the volume to the notice of the Union, it will be possible to make helpful improvements in a later issue. A funda-

A go-slow movement was staged by guards of the Alianza section of the San Martin Railway, in protest against the suppression of the round duty trip from Buenos Aires to Mendoza and back. It was not directed against the railway but the trades union authorities, which considered that the time in service was excessive. Nevertheless, the men concerned received extra pay for so doing and protested actively against the suppression of this source of considerable extra income.

San Martin Suburban Services

With the new winter timetables, the General San Martin Railway has introduced longer trains, with a minimum of nine coaches, on its suburban services to José C. Paz and Pilar. These trains are hauled by diesel-electric locomotives; for the time being it has been necessary to borrow four from the D.F. Sarmiento and two from the General Mitre Railway. They will be returned as soon as the first of the 45 Alco units about to be received are placed into service.

UNITED STATES

Cleveland Union Terminal

In pursuance of its policy of disposing as far as possible of all station property on which losses are being sustained in operation, the New York Central System is offering for sale the Union Terminal in Cleveland, Ohio, the city's major railway passenger station. The suggested price is \$25,000,000, and it is rumoured that the city may agree to buy the structure to serve as a convention hall. The sale would not include the Terminal Tower, a 52-storey skyscraper which is occupied as offices.

Actually the N.Y.C. is not the exclusive owner of the terminal, as the Nickel Plate owns 10 per cent of the share capital. The station is also used by the trains of the Erie and Baltimore & Ohio Railroads, and all four companies

would have to find other accommodation for their trains if the sale took place.

Staff Support for the Railways

The Maine League of Railroad Men & Women, composed of railway staff in the State, is intended to support and sponsor legislation likely to be helpful to the railways, and also to campaign for candidates for election to the State legislature who will promise to back such legislation. The campaign is being watched both by the managements of the Maine Central and Bangor & Aroostook Railroads and by the trades unions concerned. Some successful results have been achieved already in defeating legislative proposals which would have benefited road users, and probably at the expense of the railways.

ITALY

Electrification in Sicily

Electrification at 3,000 V. d.c. from Messina to Catania (60 miles) is expected to be completed shortly. The work involves re-signalling and improvement in telecommunications. The fastest running time will be reduced from 89 min. (with a stop at Taormina) to 60 min. From Catania it is intended to extend the electrification another 55 miles to Syracuse.

SWITZERLAND

S.F.R. 6,000-h.p. Locomotives

Delivery to the Federal Railways of the 12 additional locomotives of the 6,000-h.p. "Ae 6/6" type, each with the Co-Co wheel arrangement, is now approaching completion, and will bring the total of this class to 26. Of these, 24 are allocated to the Gotthard main line, and the first two have now made their appearance on the Simplon main line, where they are used for hauling the accelerated "Simplon-Orient Express" and the Paris-Trieste express between Vallorbe and Domodossola.

mental and most unfortunate defect of this, as of some similar works, is the omission to give the genders of the nouns. This much reduces the value of the book, as without this information it is often impossible to be sure of writing a grammatical sentence in some languages. Like other technical dictionaries, this attempts to express the equivalent of one word or phrase in one language by one word or phrase of another when there is no exact equivalent; in such cases explanatory notes are needed for accuracy.

How Not to Hide our Light Under a Bushel.—This well-produced booklet on salesmanship has been issued by the Commercial Officer of the North Eastern Region of British Railways, Mr. W. H. Vine, to commercial representatives, goods agents, stationmasters, and

other senior staff of the Region in contact with the public. The technique of selling transport and making the correct commercial approach is explained clearly and concisely, with some thumbnail cartoons. The wide range of facilities which the railways have to offer to industry and the travelling public is well summarised. The advantages of passenger travel by rail are enumerated—and not a few railwaymen will find they have forgotten some; more might have been said, perhaps, of punctuality and reliability of trains, and of ways of discussing these points with prospective passengers. The sections on goods are well expressed. The multiplicity of the services which railways can offer should always be remembered by the staff. The booklet rightly states: "You are not confined to just a single line of detergents but have so many lines to offer."

Seventeenth International Railway Congress**Advantages of High-Speed Electronic Apparatus***Application to railway administrative work: checking the movement of rolling stock to give improved distribution*

MONSIEUR B. H. DE FONTGALLAND, Head of the General Research Section, French National Railways, Paris, has prepared the report on replies to Question 7 to be considered by the International Railway Congress in Madrid in September. It is based on practice in European countries and in certain overseas territories which in general follow European methods.

Replies were received from 45 railway administrations. Among them, 29 stated that they were unable to provide the information requested because the advent of the electronic data processing machine (E.D.P.M.) was still of such recent date that they had not yet been able to complete the preliminary studies. Many of these administrations were of the opinion that their size and operating characteristics did not appear to justify the use of such apparatus.

None of the administrations consulted is in fact using E.D.P.Ms. This does not surprise the reporter as the machines concerned have only been available for a few years. It will, therefore, take several years before the first users will be able to draw up a balance sheet of their experience.

Applications

The applications envisaged in the first instance by the German Federal Railway concern freight traffic accounts and statistics, stores control, and certain problems of statistics and planning. The Austrian Federal Railways intend to assign all the work at present carried out by conventional punch-card equipment to one E.D.P.M. This work includes payrolls and pensions, premiums and control of train crews, staff accident statistics, control and statistics of freight traffic, control of receipts from international traffic, motive power performance statistics, and supplies control.

The feasibility of handling payroll accounts for a staff of some 70,000 by E.D.P.M. is at present being studied by the Belgian National Railways in collaboration with several firms. Descriptions of other work at present being handled by mechanical methods have been supplied to the firms which have been invited to submit proposals with a view to installing a high-capacity E.D.P.M. The Spanish National Railway is investigating the use of an E.D.P.M. for the movement control of goods wagons to reduce the wagon turn-round time. It is envisaged, in the first instance, to reduce the time spent in marshalling yards, for the routing of trains, and for loading and unloading. It is also intended to scrutinise the individual vehicle mileage statistics from a maintenance point of view.

The placing of an order by the French

National Railways for a high-capacity Bull Gamma 60 E.D.P.M., due for delivery in 1960, conforms to an ambitious programme of centralising the whole of the administrative, accountancy and financial work as well as certain aspects of the technical administration.

At present, important activities such as movement, supplies, parts of the accounts, and so on, are still carried out manually whilst the control of staff, the payment of pensions, accounts and control of freight traffic, supplies accounts and various statistics are carried out in 12 punch-card installations of the conventional type, all located in Paris and working either for the railway as a whole or for one of the Regions only. In all these cases, punch-cards are used exclusively, and all the cards, more than 200 million a year, are punched in the offices themselves. All the basic data are therefore processed in Paris and the results are only available globally, after a certain time. Finally, all the offices work at present to the limit of their single-shift capacity, and a change-over to two-shift operation would cause difficult staffing problems.

An examination, carried out in 1956, of the possibilities offered by E.D.P.Ms has resulted in a new conception of the organisation dealing with all administrative data. This conception is based on the following principles: Mechanisation of all the spheres of administrative work; integrated processing of all the information contained in a basic document; decentralisation of the mechanical transcription of the basic documents; and decentralisation of the evaluation of results of purely local interest.

This new organisation will in no way affect either the chain of command or the decentralisation of executive functions.

The departments will continue to supply the basic data, either in the normal form of statements or, wherever this alternative seems to hold promise of improvement, directly in mechanically recorded form.

Multi-purpose district centres, which will be provided with light mechanical processing equipment of the conventional type, will ensure the re-arrangement of the basic data within their own district; they will deal domestically with those data which permit the evaluation of statistics or results of local interest, and will forward their information to the central office.

A central office, at headquarters, will ensure the centralised handling of all the data, and will produce all the statements necessary for the different managerial levels.

In the first instance the E.D.P.Ms will be used for payroll accounts and

control of active staff, quarterly pensions for 400,000 retired members of the staff, social service payments, and wagon-load freight traffic accounts and statistics. These various jobs are at present carried out by mechanical processing methods.

The French National Railways do not contemplate the creation of a special transmission system for information destined for the E.D.P.Ms. The forwarding of punch-cards or perforated tapes by night train from the district centres to the Gamma 60 installation is considered to be sufficiently rapid for all the applications envisaged.

Netherlands Railways

The Netherlands Railways intend to use E.D.P.M's partly for known problems, such as payroll accounts, and partly for problems difficult to tackle by conventional methods, such as the calculation of wagon-load charges. Particular emphasis is laid on the advantage of being able to use E.D.P.M's for work of a scientific character which has already been promoted with the aid of punch-card equipment. This type of work includes the solution of equations of a higher order, the calculation of timetables, and the calculation of curve realignments.

The applications generally considered by all administrations as being suitable for a first stage in the use of E.D.P.Ms are payroll accounts and control of active and retired staff, accounts and statistics of freight traffic, and performance statistics. The reason for the prior choice of these applications is that in nearly all cases the work is already carried out by punch-card methods which, though well developed, involve heavy work because of the volume of units to be taken into account, and the large number of grades of pay and statistical classifications. E.D.P.Ms are also expected to reduce the time within which the results become available so that decisions can be taken more effectively.

Although the reporter has not been able to obtain a precise picture, on the strength of the replies furnished by the administrations, it appears that the problems concerned are mostly not at present tackled by comprehensive punch-card treatment, and that they represent applications where the use of electronic data processing equipment holds a promise of improved management control.

The problem of distributing empty wagons has not been mentioned by any administration. Monsieur Fontgalland, however, considers it to be a problem which would be particularly interesting to study, in view of its repercussions on operation. At least two administrations

have decided to use their E.D.P.M.'s as a means of centralised management. They propose to make a start with the applications already tackled by punch-card methods.

Most of the administrations propose to reserve a part of the capacity of their E.D.P.M.s for carrying out studies of a scientific character and, in particular, for operational research.

The great diversity of applications studied and, on the other hand, the profound differences as between one administration and another provide ample confirmation that E.D.P.M.s. represent instruments of great flexibility of use, capable of making a worthwhile contribution to all management problems with which railway administrations are confronted.

E.D.P.M.s. are able to carry out all those jobs which can be carried out with conventional punch-card methods, but with greatly improved speed and accuracy; their superiority is most marked where large-scale operations are involved. It is possible to create, simultaneously, several specific index systems for the same category of data so that it becomes easier to keep up-to-date and to analyse the data pertaining to different grades of pay or statistical classifications. The magnetic tape, in particular, affords a new solution to the problem of operating large size index systems. It is also possible to carry out spot checks while an operation is going on; the sample obtained can be recorded and kept up-to-date with a view to subsequent studies.

Stores Accounting

For application to stores accounting, a permanent stock ledger is recorded which comprises in particular, the identification number of each item, the consumption statistics for recent months, the orders placed, the re-order level adopted, and the normal suppliers.

Any change in the level of stocks, any new orders, modifications to the re-order level, and changes in the list of suppliers, are periodically introduced into the E.D.P.M. as and when the permanent ledger is processed. Whenever a new movement causes the stock position of an item to become critical, judged by the application of the re-ordering level adopted, all the information concerning that item will be produced in print. The official responsible for watching the levels of stocks will, therefore, be in possession of all the quantitative data which will enable him to decide the extent of the order to be placed.

Instead of having to consult periodically a considerable number of statements where most of the information is without immediate interest, the official concerned will be able to concentrate his attention on the comparatively few exceptions to the established rules, and to make correct decisions based on detailed and recent information.

One of the documents indicating the movement of stocks and used for keeping the stores ledger up-to-date, is the stores issue voucher. This document

also contains data relevant to the accounts: price per unit, allocation to a given account, and so on. With the aid of other information it is therefore possible to obtain, from the same document, the stocks accounts and certain data pertaining to cost accounts. It is therefore possible, with the aid of the E.D.P.M., to process the same document for several different purposes. This represents a considerable advantage compared with established punch-card methods where all the information contained in the basic documents must be processed successively according to the nature of the results required. In practice it is often necessary to punch several cards which contain a considerable quantity of common identification data.

Economic Aspect

The savings expected by the Spanish National Railways with the introduction of the first stage of electronic data processing are solely of an indirect nature, and not immediately quantifiable. The Finnish State Railways, without providing quantitative information, state that their economic assessment will merely take into account the savings resulting from the replacement of existing equipment by the E.D.P.M.

The French National Railways state that studies of the Bull Gamma 60 equipment, which is intended, during the second stage, to gradually take charge of all the management control problems, have shown that the annual cost for the machinery of the new organisation will not be greater than the cost of the existing punch-card equipment, in spite of the fact that several new applications will be added. The reductions in the establishment of punched-card operators alone will ultimately result in a clear saving which will more than outweigh the cost of the machine, so that a substantial economic advantage is ensured. The calculations are based on an amortisation period of four years.

If an administration requires to transfer the work of an established punch-card installation to an E.D.P.M. without change of methods, it is possible to carry out an ordinary economic comparison based on the cost of the equipment and that of the staff engaged in punch-card operations. This is mostly the case where the use of an E.D.P.M. of medium capacity is envisaged. The same method of calculation can also be used in the case of well defined manual works, carried out in specialised offices.

Direct savings can usually be determined fairly easily, whilst indirect savings, such as improvement in management control, can, at the outset, only be estimated approximately.

There is, however, a certain minimum volume of administrative work below which any kind of mechanisation ceases to be an economic proposition. The development of the conventional punch-card methods has shown that this minimum level is gradually lowered. The reporter is of the

opinion that this will also be the case with E.D.P.M.s. if the volume of administrative work increases constantly, the cost of clerical labour also increases constantly, and the cost of mechanised work shows a constant downward trend.

Study of Methods

Several administrations consider that E.D.P.M.s. represent the latest stage in the development of conventional mechanical methods, and have therefore entrusted the bodies responsible for these methods to carry out investigations on electronic data processing. This is the case in particular on the German Federal, Spanish National, Finnish State, and Swiss Federal Railways.

Certain administrations, such as the Belgium National and Italian State Railways, have appointed full-time officials to study, with the representatives of one or several manufacturers, the use of an E.D.P.M. for certain applications. The Netherlands Railways have created a body responsible for the general direction of the studies in which the following departments are represented: operating, traffic, rolling stock, permanent way, signalling, economic efficiency, and finance.

In nearly all cases, the studies into the application of E.D.P.M.s. have been initiated by a committee at headquarters level in which the heads of all departments are represented. After a preliminary exploration of the possible fields of application, and once the equipment has been chosen, the centralisation of the definitive studies is the procedure most frequently adopted. If there is a special department responsible for punch-card processing methods, it is usually this department which is entrusted with the studies.

With the first users, it has been common practice to call in consulting engineers, either for the selection of the equipment or for the direction of the studies. This applies, in particular, to undertakings which do not possess an organisation and methods department of their own.

As regards the definitive studies, it is general practice to set up full-time working parties, specialised for each application. These working parties normally include specialists in administrative methods and programming as well as representatives of the departments concerned. These teams may comprise as many as ten persons.

The time taken up by these studies varies considerably. It is not less than six months even in the case of a single transfer of mechanised work to an E.D.P.M. of medium capacity. In other cases, these studies often take more than two years.

Although none of the administrations who were consulted have, as yet, had any practical experience with E.D.P.M.s., the reporter considers that the machines are well suited to deal with the kind of problems encountered in railway management, and are able to bring about marked improvements compared with present methods.

Koedoespoort Workshops, South African Railways—2*

Extensive and diverse range of machinery and tools to give high level of production

THE main function of the machine shop at Koedoespoort is the manufacture of locomotive and rolling stock spares. The raw materials used are mainly steel, brass and iron castings from the Pretoria foundries, forgings from the works' blacksmith's shop, and bar stock purchased from suppliers. Besides supplying the requirements of the works, this shop manufactures many items distributed to other workshops of the S.A.R.

The production control office, which controls the work-loading, supply of material and movement of work from one section to another, has divided the 364,687 sq. ft. floor space of the shop into 13 sections, each with a specific function. Of these, the milling, drilling, turret lathe, combination lathe and shaping and grinding sections are closely co-ordinated. They handle normal types of machining work, and most of the production work passes through some or all of these sections.

General Milling Section

In the general milling section of the machine shop is a Cincinnati No. 5 heavy duty vertical milling machine, fitted with all normal standard features. A 50-h.p. motor enables full use to be made of tungsten carbide milling cutters, used extensively for milling a variety of drop forged, cast steel, and other items. The section contains 10 other milling machines, vertical and horizontal, of various makes.

The drilling section comprises five sensitive and pedestal drills of various makes, besides one 6-ft., six 4-ft. 6-in. and one 4-ft. radial drills, two vertical drills, three screwing machines, one Webster & Bennett 36-in. duplex boring machine, and two key-seating machines.

The turret lathe section is laid out with six Herbert No. 4 capstan lathes, two Herbert No. 2D lathes, six Herbert No. 9B lathes, four Herbert No. 2 hex. lathes, three Ward No. 3A capstan lathes, and seven Ward No. 7 lathes.

The combination lathe section is equipped with one Ward No. 10, 12 Ward No. 7, nine Herbert No. 9B and one No. 9B 30 combination lathes, and one 6-in. circular saw.

Shaping and Grinding

The shaping section also does heavy planing and boring work such as the machining of locomotive cylinders. With the grinding section it contains three Webster & Bennett 36-in. duplex boring machines, two Kearns No. 5 and one Kearns No. 4 universal horizontal boring machines, one 6-ft., one 8-ft. and one 12-ft. planers, one 15-in. punch slotter, two 14-in. × 24-in. vertical slotters, three Lumsden 6-ft. ×

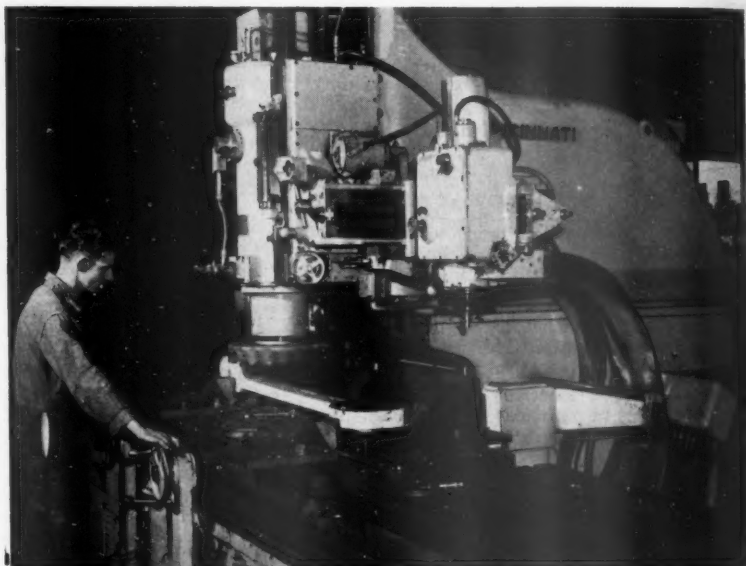
2-ft. grinders, and nine shapers with capacities of from 28 to 32 in.

The three Lumsden type 72 Leod surface grinders of heavy duty, reciprocating table, vertical spindle type are used for the surface grinding of locomotive slide bars, wagon axleboxes, bogie sideframes, and so on. The segmental grinding wheel is 26 in. in dia. and is controlled by both automatic and hand down feed. The table working surface is 24 in. × 84 in. and the full travel of table is 115 in. Table speeds are variable between 15 and 60 ft. per min.

Each machine is fitted with a 40-h.p.

The machine accommodates workpieces from $\frac{1}{8}$ in. to $1\frac{1}{2}$ in. dia., and, it is stated, can handle workpieces up to 78 in. long by the through rolling process. This has not been tried, however, at Koedoespoort. The accuracy obtained by the process has been very satisfactory, being comparable with the finest ground finish.

Two other special machines operating in this section are a Cincinnati No. 2 centreless grinder and a Peddinghaus flame-hardening machine, model UVW 202/11. The remainder of the machine tools are one combination lathe and 11 centre lathes of 8½-18-in. capacity.



Cincinnati Hydrotel vertical miller machining a locomotive coupling rod in the motion section

motor. This, coupled with large table sizes, makes it possible for very large work to be handled. This is stated to have been found more economical in many cases by the S.A.R. than other methods such as milling or planing.

Centre Lathe Section

Several special machines not usually encountered in South Africa are installed in the centre lathe section of the machine shop, which does heavy turning work on components such as piston liners, piston rods, and shafts.

One of these is a Thommen thread rolling machine, used for the production of threaded boiler stays and other similar items. Threading is either done by "plunge" rolling or "through" rolling. The workpiece is subjected to the pressure of two rotating rollers carrying the required thread form, which is thus "squeezed" or rolled on the workpiece.

To cope with the considerable demand for locomotive boiler mountings in an economical manner, a brass shop has been set up within the machine shop. This undertakes the machining from castings, or bar stock, fitting and testing of locomotive boiler mountings on a mass production basis.

Bogie and Wheel Sections

Sarcast bogie components form a large part of the work handled by the machine shop and a Sarcast cast steel bogie department has been set up to effect the requisite shaping, grinding, drilling and turning. It contains three boring machines, one 15 in. slotter, one 2 ft. × 5 in. horizontal grinder, one 2 ft. vertical grinder, five 4 ft. 6 in. radial drills, two Loudon 11 ft. × 3 ft. and one Butler 15 ft. × 6 ft. planer.

Equipment in the machine shop includes three wheel quartering machines,

*Part 1 appeared in our issue of June 27

three locomotive wheel journal lathes, three locomotive wheel topping lathes, two single head tyre borers, three carriage and wagon wheel topping lathes, and two bogie and tender wheel journal lathes, all by Craven Bros.; two hydraulic presses, of 600- and 400-ton capacity, two George Fischer K.D.M. 18/250 copying lathes and two Massey No. 2 tyre rollers are also included beside the usual complement of machines associated with this type of work.

A Hey No. 3 double-ended centring and facing machine has been found very useful. Centring and/or facing, prior to further machining, is undertaken simultaneously at both ends of the work-

travel of spindle head is 30 in. It is capable of comparatively fast metal removal rates during the profiling operation. In conjunction with this Hydrotel machine, a large bed type milling machine capable of handling the profiling and fluting of large connecting and coupling rods is shortly to be installed.

This latter, a rigid Hydrocopy model P-301 bed type milling machine, weighs some 63,000 lb. bare, and has a table working surface of 117 in. \times 40 in., and is capable of undertaking the profiling of four rods simultaneously and the fluting of two rods simultaneously. It is fitted with hydraulic copying arrangements which will enable the full range

The machining necessary for the fitting work done during locomotive assembly is undertaken in a special section situated in the erecting shop.

A Schiess vertical boring and turning mill is used for the machining of locomotives' cylinder liners and similar components. The particular feature of this machine is the 43-in. maximum tool travel of the tool head on the cross rail, which provides the means for turning and boring large lengths. The machine is fitted with a side head and with a copying attachment with electrically-operated tracer control. Over 50 other machine tools of all types are also installed in this section.

Toolshop

The toolshop occupies an area of 50,625 sq. ft. and is subdivided into five sections, one of which constitutes a tap and reamer manufacturing unit, which supplies all the special requirements of the S.A.R. All sections contain tools either unique or very rare in that country. The toolshop has been laid out so that the routing usually associated with production machine shops can be undertaken. Thus heavy machinery for shaping and milling is located at one end of the shop, followed by the milling and turning machining sections. This is linked with the tap and reamer section. Next comes a bench section, then a heat treatment and, finally, the grinding section. All toolwork therefore follows a material flow-route through the shop.

Tap and Reamer Manufacture

One of the machines used in the manufacture of taps and reamers is a George Fischer Model K.D.M. 7/50 copying lathe. This hydraulically-controlled machine tool is used in the manufacture of taps, reamers and a variety of other small tools. A six-cut automatic recycling device is incorporated; this allows up to six consecutive cuts to be taken automatically. The use of refinements such as an automatic skip feed—which enables portions of the workpiece, where machining is not required, to be traversed at high speed—and automatic feed halving for use when facing or turning radii, further improve the output of the lathe.

The major equipment in the machining section includes seven 8½-in. and one 10-in. centre lathes, one No. 7B turret lathe; two No. 4, and one No. 3 universal milling machines, one No. 2 vertical milling machine, all by Cincinnati; one vertical milling machine, one 36-in. open side planer; seven shaping machines ranging from 36 to 18 in., five being of Churchill Redman design, six contour and power saws, and one 12-in. precision slotter.

The greater part of the precision work is handled by the toolshop grinding section, which contains five machines of special interest. Two of these are Studer gap gauge grinding machines, one model RLS. 200 and one model RLS. 400/1000. These machines are used for the grinding and lapping of gap, or snap, gauges, being capable of



General view of the shaping section in Koedoespoort tool room

piece, the machine being equipped with two cutting heads. Automatic feed motion is fitted, giving rapid advance to work, slow feed for centring, dwell for facing, quick return and automatic trip. Accuracy of faced blanks can be held to very close tolerances.

Motion Section

The repair and manufacture of locomotive motion rod details such as connecting rods, coupling rods, return cranks and reversing links, is undertaken in the motion section, which is equipped with a Cincinnati Hydrotel milling machine. This machine is used mainly for the machining of the profiles of various locomotive connecting, coupling and motion rods. It is fitted with a 360 deg. automatic hydraulic profiling mechanism.

Hydraulic control to all slide movements is provided and the table and cross slide feed rates are infinitely variable over a range of 1 in. to 25 in. per min. Spindle speeds range from 22 to 550 r.p.m.; the working surface of table is 28 in. \times 143 in., the longitudinal travel of table is 120 in. and the cross

of profiling required to be undertaken.

The main spindle is powered by a 60-h.p. motor and a speed range of 20 to 450 r.p.m. is obtained. Longitudinal feed ranges from ⅜ in. to 16 in. per min., and is arranged for suitable compensation when the milling cutter proceeds to move downwards rather than in a horizontal direction.

Boring Machines

Among other machine tools in the motion section are two Kitchen & Wade duplex head boring machines, used primarily for the initial and finish boring of holes in locomotive coupling and side rods. They are fitted with two vertical spindles capable of adjustment spindle centre as follows: maximum distance 12 ft. 6 in. and 14 ft. 6 in. respectively; and minimum distance 2 ft. 6 in. These machines were supplied with two compound tables (22 in. \times 22 in.) and a centre distance of spindle to column supports of 16 in.

The section also has the usual complement of tools such as duplex rod borers, slotters, duplex boring machines, drills, grinders, shapers, and so on.

producing articles accurate to within 0.0001 in. The former model is capable of grinding and lapping gauges up to 8 in. in width, and the latter, up to 16 in. Gauges up to 40 in. can be handled, but they can only be ground.

A further machine is a Studer Type PSM. 130 form tool grinder, which is used for the grinding of all types of high speed steel and tungsten carbide form tools and dies. The machine operates through the movements of a stylus, swivelling about its tip, which are transmitted by pantograph and link-bars to a grinding wheel which can swivel about its cutting edge. The stylus is guided along a template made to the required scale, the grinding wheel shape corresponding to that of the stylus tip. The workpiece is carried on a table which reciprocates past the grinding wheel in the vertical direction. The maximum length of grinding in one operation is 6 in.; the maximum stroke of slide carrying workpiece is 2½ in., and the maximum diameter of workpiece accommodated for circular grinding of 360 deg. is 4 in.

Automatic Stylus Control

A feature of this form tool grinder is that the control and feeding of the stylus along the template can be controlled automatically, thus eliminating manual operation.

A fourth tool is a Wagner model LT circular saw sharpening machine, used for resharpening metal cutting circular saws, which are largely of the segmental build-up type. It is capable of accommodating circular saws varying from 10-52 in. dia., and is provided with a swivelling head for adjusting the rake angle of the blade. An automatic indexing device operated by change gears eliminates pitch errors of the cutting teeth on the saw.

Vertical Surface Grinder

A Snow model V.A. 12 surface grinding machine which is of the vertical spindle type is employed for a variety of operations, such as on bases of single point cutting tool blanks and certain die block faces. The reciprocating work table, which has a 32 in. × 10 in. working surface is hydraulically controlled and provides a maximum longitudinal travel of 3 ft. 6 in. The infinitely-variable table traverse feed is 5-80 ft. per min. The total number of other machine tools used by the grinding section in its general toolshop work is 46.

Among the more unusual machines in the toolshop die sinking section are two Pratt and Whitney No. 3 B universal die sinking machines. These are used for the manufacture of various drop stamp dies and hammer blocks. Each machine has an oscillating head for 0-6 in. oscillation 16 spindle speeds ranging from 33-1, 250 r.p.m.; a table working surface 15 in. × 40 in.; and is fitted with longitudinal power feed.

The power-operated oscillating head, equipped with suitable feeds, enables a standard die sinking cutter to be automatically moved through a circular

path, thereby generating a cylindrical cavity as the die block is moved longitudinally, and producing a clean cherrying cut. This reduces hand finishing to a minimum.

Heat Treatment Section

In addition to the sections described above, the toolshop also possesses a heat treatment section and metrological section. This includes salt baths, various box type furnaces, a gas carburising furnace, forced air circulation furnaces and high frequency induction heating unit; all are electrically operated and fitted with the necessary temperature controlling and recording instruments.

The metrological section is equipped to handle all types of work and a variety of measuring machines and other equipment is available. This applies particularly to equipment for thread measurement, which is housed

movement is much more than that found on a conventional milling machine with a fixed milling head. When used as a plain horizontal miller, the milling head ram can be totally backed away, allowing complete use of capacity of the machine. The milling head proper is of swivel construction, allowing any draft angle to be set easily, which is particularly useful in the case of pattern milling.

For machining large workpieces, a large Huron horizontal milling machine of the series type L8, with a table size of 150 in. × 59 in. is installed. This has been found to be suited for machining operations on large workpieces such as large pattern plates whose weight or dimensions would otherwise require much larger machines.

A Schiess KE 125 vertical boring and turning mill has been installed in the metal pattern shop for the manufacture



Some of the five Huron type K.U.6. vertical milling machines with ram-type milling heads for making metal patterns

in two temperature controlled rooms totalling some 425 sq. ft. in area. The temperature, humidity, and dust content of the air is controlled.

Pattern Shop

The pattern shop at Koedoespoort consists of wood and metal sections separated down the centre of the shop. Some of the metal working machine tools, incorporating latest developments in machine tools, which have been installed in the metal pattern shop are of considerable interest.

As much of the work in making metal patterns can be handled by milling machines, five Huron type K.U. 6 have been installed; these machines have a table 78½ in. long × 16 in. wide.

As the ram type milling head has a power cross feed, the range of cross

of circular patterns. It is fitted with automatic feed trips with dead stops for the vertical and horizontal feed of the cross rail head, allowing for the duplication of some of the circular patterns.

An Oerlikon universal drilling and boring machine, type U B 2, has also been provided as a universal drilling machine used on pattern plates and patterns.

A triple-cutter die-sinking machine installed in the metal pattern shop, is a Heiliginstaedt model 80FK horizontal spindle die sinking machine with contour or profile tracer combined with line-by-line automatic tracer, known as the Heyco design. A total investment of some £100,000 is reported to have been made for pattern making machine tool equipment.

(Concluded)

ELECTRIC RAILWAY TRACTION SECTION

Return Current Through Roller Bearings

AN unusual number of early failures in the roller bearings of motor coaches on the Belgian National Railways has led to a special investigation of the effects on these bearings of traction current returning through them to the rails. At the time when the failures were being studied by the railways and the manufacturer concerned, it was noticed during a periodical overhaul of the "122" class locomotives that the rollers of the axlebox bearings had become marked with a series of regularly-spaced black lines parallel with the axis, which revealed the presence of cracks with a depth of a few hundredths of a millimetre. This was the starting point of a series of experiments which has been described by Messrs. P. Weytens and J. Van der Vurst of the S.N.C.B., in an article beginning in the July issue of *La Traction Electrique dans les Chemins de fer*, issued by the International Union of Railways (U.I.C.).

The authors review published theory on the phenomenon which traces the effect of return current on roller bearings to an origin in a transfer of material similar to that which occurs between electrical contacts. In this way a deposit composed of iron oxide and residues from the lubricant is formed on the bearing races, to which it adheres firmly. In a plain bearing the axle is carried by a continuous film of oil which tends to damp out oscillatory movements, but in a roller bearing the rollers have some play between the outer and inner races, and at any moment only some of them are fully loaded. As groups of rollers take up the load, there is inevitably some transmission of shock between the outer and inner races, and in the absence of a damping medium such as the film of oil in a plain bearing, oscillatory movements of the rollers may be set up. While these effects are satisfactorily withstood by roller bearings in normal conditions, they cause cracks in the film formed on the races of a bearing carrying current. The resultant irregularities aggravate the oscillations to a point where the hammering causes further cracks to appear. These cracks are found on the inner race, on the rollers, or on both simultaneously, but rarely on the outer race, since normally the onset of the trouble would be detected and the bearing replaced before this stage had been reached.

It is general practice on Belgian National Railways rolling stock for the negative sides of the motor circuits (each consisting of two 1,500-V. motors in series) to be interconnected by an uninsulated cable attached to the underframe, with flexible cable links to the bogie frames. From here the paths to the rail vary according to the form of suspension, the method of mounting the motor, and the drive to the axles. Several circuits are available, and the proportion of the current which they carry varies continuously, particularly when one of them is through a motor nose suspension. Only one example of a return current brush is quoted. This is used in the "121" class locomotives with Brown-Boveri disc drive and consists of a carbon-bronze brush connected electrically to the bogie frame and bearing against the face of a disc fixed to the axle behind one of the wheels. By this path there is a volts drop of only about 0.3 V. at the most, so that very little load is carried by the alternative circuits to the rail, one of which passes through the roller bearing axleboxes. It is reported that the condition of the bearings in these locomotives has remained very satisfactory up to now. In all new motive power for the Belgian National Railways, however, the motors are nose-suspended. It is recognised that the most certain means of keeping current out of the axleboxes is to isolate them electrically, but when this is done the alternative paths available must be improved. This is being achieved experimentally either by means of earthing brushes on the axle journal or by fitting a flexible shunt from the motor frame to the bogie frame, by-passing the nose suspension. Experiments are now being conducted to find whether such a shunt may be so effective

that insulation of the roller bearings is unnecessary because no appreciable current would pass through them.

The problem is of interest to all railways using the rails as a return conductor, particularly since the formation of a deposit on the bearing races by the phenomena described occurs equally with direct and alternating current. It must also be taken into account when considering the use of roller bearings for motor suspension, a practice now seen in third-rail stock on British Railways. The ability of roller bearings to stand up to the mechanical conditions so imposed has been demonstrated on the London Underground, where the insulated return relieves them of carrying current. Methods of by-passing them electrically on running rail return systems are a valuable subject for research when electrification extensions give special importance to the easy maintenance characteristics of this type of bearing in normal conditions.

New Manchester-Bury Stock

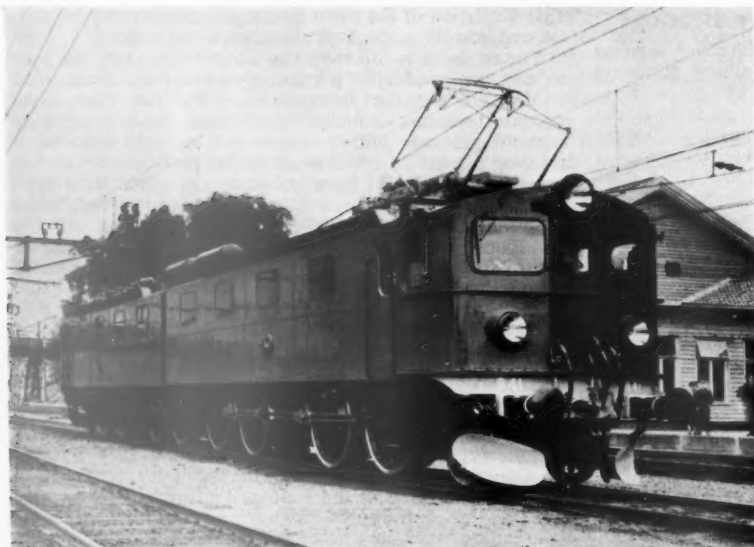
ALTHOUGH they are to be built at Wolverton, the new two-car sets for the Manchester-Bury line of the London Midland Region will resemble recent Eastleigh products such as the Euston-Watford and Liverpool Street-Southend trains in having a combination of open type and compartment accommodation. Earlier examples of this practice were the Southern Region two-car sets of 1953 for use in 10-car trains, and the similar sets built at Eastleigh in 1955 for the South Tyneside electrified line of the North Eastern Region. As in the South Tyneside stock, there will be first class accommodation in the new Manchester-Bury trains. Some modification of appearance will be achieved by designing the cab fronts with a backward slope towards the roof, besides angling them back from the centre to the sides, so giving the driver better vision and improving the look of the trains. Such attention to front-end appearance is welcome in the light of criticism that has been directed at this aspect of the Hastings diesel-electric sets. Each two-car set, consisting of motor coach and driving trailer, will carry 16 first class and 162 second class passengers. The coach bodies will be of welded steel construction, with insulation against sound and external temperature changes. There will be 34 passenger doors in a set, for quick loading and unloading at stations. Interior features are to include a blend of timber and plastic-faced wall paneling, light alloy luggage racks, and double-spring seating.

Reference to the placing of the order for the four-motor electrical equipments with the English Electric Co. Ltd. was made in our issue of May 23. The motors will be wound for 600 V. (nominal) and connected in series pairs. As a correspondent recalls in a letter published in our June 20 issue, the motors in the present Manchester-Bury stock are 1,200-V. machines, so that in the event of a fault in one of them, the faulty motor could be isolated by itself and operation continued with three serviceable motors in the affected coach. When wound for half line voltage, however, as in the English Electric equipments for the Manchester-Bury sets, a faulty motor necessitates isolating the pair to which it belongs. This practice is so general today in 1,500-V. and 3,000-V. d.c. schemes that the use of line-voltage motors in the Manchester-Bury trains as early as 1915 shows the foresight of the electrical engineers of the Lancashire & Yorkshire Railway.

As we noted in our June 6 issue, the decision to retain the 1,200-V. system on this line was taken because the need for modern rolling stock was too pressing to await the 50-cycle conversion originally planned, and advantages must have been seen in using motors similar to those on the extensive 600-V. mileage of British Railways, even though it was not possible to do away with the unusual voltage and side-contact conductor rail.

Swedish State Railways 5,500-h.p. Single-Phase Locomotives

Double-unit design for iron ore traffic on Luleå-Narvik line



"Dm" class 5,000 h.p. 1-D+D-1 electric locomotive

IN the paper presented by Mr. Erik Upmark, Director-General, Swedish State Railways, to the Institution of Locomotive Engineers on February 26 (see our February 28 issue), reference was made to the heavy loads hauled by electric locomotives operating on the 15,000-V., 16 $\frac{2}{3}$ cycle system in Sweden. On the iron ore line from Luleå, in Northern Sweden, to the Norwegian frontier and the port of Narvik, the length and weight of trains have increased progressively since electrification. The earliest Swedish locomotives for this route had the 1-C+C-1 wheel arrangement and developed a starting tractive effort of 55,000 lb. Later designs, with the same wheel arrangement and maximum speed (37 m.p.h.), raised this figure to 66,000 lb., but today the working of 65-wagon trains weighing 3,100 tons has made it necessary to use locomotives capable of a maximum tractive effort at starting of 117,000 lb.

These powerful locomotives, known as Class "Dm," have the same electrical equipment as the standard Swedish 1-C-1 locomotive of Class "Da." As a preliminary to their construction, an experimental locomotive was produced by rebuilding an earlier "D" class locomotive with a fourth driving axle and a gear ratio which lowered the top speed from 62 to 47 m.p.h. The practicability of four coupled axles in a "D" type frame having been thus demonstrated, the "Dm" class was evolved by coupling two units which are virtually two "Da" locomotives each with an extra driving axle and one Bissel truck instead of two, and with the altered gear ratio mentioned above. The result is a 1-D+D-1 locomotive with a maximum

starting effort of 117,000 lb. and able to start with a train of 3,100 tons against a gradient of 1 in 100. A speed of 25 to 28 m.p.h. can be maintained up this gradient with the same load, involving a tractive effort of about 101,000 lb., corresponding to an output of over 7,000 h.p.

Experience in Sweden has shown side-rod drive to be satisfactory for speeds

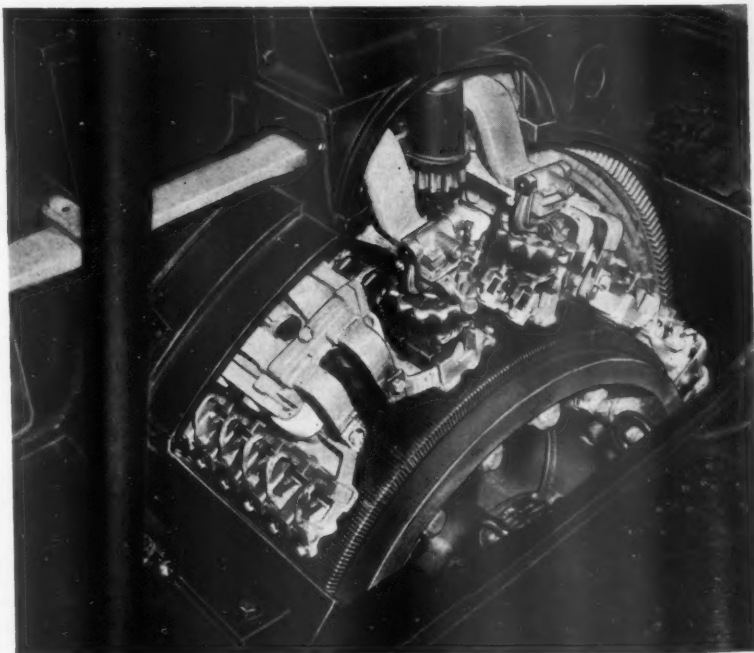
up to the maximum normally required there, while conferring various advantages which were dealt with in the paper mentioned above. This form of drive is used in the "Dm" class, where it enables the power requirements to be met with only four motors, two driving the four axles of each unit of the locomotive.

Underframe

The locomotive is articulated and consists of two identical halves. The underframe is built up of 1 $\frac{3}{8}$ -in. plates with a depth of about 3 ft. 3 in., joined by a number of riveted cross members. The headstocks are also riveted to the frame plates. A cast steel motor housing between the second and third driving axles also acts as a transverse member of the frame. This housing accommodates the bearings of the common jackshaft, to which the two motors in each unit are geared, and from which the axles are driven by side rods.

The jackshaft, two of the four driving axles in each half of the locomotive, and the axles of the Bissel trucks are carried in S.K.F. spherical roller bearings, and similar bearings are fitted to the side rods at the crankpins of the outer coupled axles, which are laterally rigid. The inner coupled axles have a sideplay of plus or minus 1 $\frac{1}{2}$ in. and are carried in journal bearings; side rod bearings at these axles are also of the journal type.

The body is of riveted sheet steel with interior reinforcement by vertical



Commutator of one of the motors with cover removed, showing the brushgear

and horizontal members, and is supported by brackets on the underframe. All windows consist of a single pane of glass mounted in Clatonrite rubber edging. Longitudinal air intakes, communicating with the motor room, are arranged on both sides of the roof. This elongated inlet results in a low intake speed so that snow is not drawn into the locomotive. Air for forced ventilation of the traction motors is drawn from inside the room by the motor blowers, but the supply for cooling the transformer oil travels direct from the air intakes through ducts to the fan inlets. In winter, the warmed air from the transformer can be led into the motor room. Driver's cabs at each end of the body are separated from the motor rooms by soundproof partitions. They are heat-insulated, and a hot plate is provided for preparing food and beverages.

The two halves of the body are articulated by a close-coupling device which allows the locomotive to negotiate curvature with a minimum radius of 490 ft. Rubber bellows protect the connecting gangway.

Traction Motors

Each motor weighs 9,460 lb.; the machines have roller-bearing armatures and drive through spring pinions at both ends of the armature shafts on to the jackshaft gearwheels. Gear ratio is 25:106. The motor one-hour rating by I.E.C. rules is 1,375 h.p., 860 r.p.m., 438 V., 2,620 A. Cooling air from the double centrifugal blower which cools each pair of motors is exhausted via ducts running through the roof. The resistive shunts for the commutating poles are built into the motor air outlets, and the inductive shunts are mounted close to the machines. A common electro-pneumatic reverser serves for each pair of motors and is mounted on the motor frame. The two motors in each half of the locomotive are connected permanently in series.

Principal dimensions and other particulars of the locomotives are as follows:—

One-hour rating (I.E.C.)	.. 5,000 h.p. (4 × 1,375 h.p.)
Corresponding speed	.. 33 m.p.h.
Maximum tractive effort	.. 117,000 lb.
Maximum speed	.. 47 m.p.h.
Length overall	.. 82 ft. 4 in.
Total wheelbase	.. 70 ft. 2 in.
Driving wheelbase	.. 2 × 24 ft. 3½ in.
Driving wheel diameter	.. 5 ft. 0½ in.
Carrying wheel diameter	.. 3 ft. 2½ in.
Adhesive weight	.. 137 tons
Total weight	.. 162.4 metric tons*

* Certain locomotives are ballasted to an adhesive weight of approximately 157 tons, total weight 180 metric tons.

Access to the brushgear and commutators is obtained from inside the motor room by the removal of covers. The connections to the brushes can then be released by means of handwheels fitted to the clamps, after which the brush ring can be rotated for inspecting the brush sets by applying a ratchet spanner to a square bolt which turns a pinion meshing with teeth on the ring. Experience has shown that the commutators do not need turning until a minimum of 370,000 miles has been run.

The Swedish regulations for traction motors permit them to be loaded with 1.7 times full-load current, or 4,500 A. in the present case. With this loading on the full-power notch of the controller and normal line voltage, a maximum tractive effort of 117,000 lb. can be obtained at speeds up to 24 m.p.h., which corresponds to an output of 7,550 h.p.

The locomotives have been supplied to the Swedish State Railways by ASEA, of Vasterås, for whom the mechanical parts were built by AB Svenska Järnvägsverkstäderna (ASJ), AB Motala Verkstad, and Nydqvist & Holm AB (NOHAB). Two orders for similar locomotives ("Ef 12" class) have been fulfilled by ASEA for the Norwegian State Railways.

Control Equipment

Two pantographs are fitted, connected in parallel, but normally only one is used at a time. The contact strips

current simultaneously. The light-weight construction of the contactors—each weighs only 49 lb.—has enabled the weight of the contactor equipment to be reduced to 60 per cent of that of the previous set for low-voltage control, in which 18 contactors provided 16 running notches. Five reactors are required in the present system instead of two. Suitable proportioning of the reactors avoids fluctuations of tractive effort during notching, and the splitting of the current into six paths on each notch enables motor currents up to 6,000 A. to be handled with a total rupturing capacity of 36,000 A.

D.C. Supply

A d.c. supply for control purposes is obtained at 72-90 volts from a battery which is continuously charged through a transformer-rectifier unit incorporating transducer control. The normal charging rate is 9A., but a boosting



Interior of cab, showing driver operating the air-brake valve

are of carbon, in accordance with the practice on the Swedish State Railways to which reference was made in our October 26, 1956, issue. Air-blast main circuit-breakers and two isolators are mounted on the roof of each unit. The isolators are operated manually from inside the motor room.

The transformer, potential-dividing reactors, overcurrent protective equipment, and cooling system with fan and oil pump form a single unit. Ten tapings on the low-voltage winding are connected to separately-mounted electro-pneumatic contactors in such a way as to provide 27 power notches on the controller. There are 30 contactors in all, and except on the first few notches six contactors carry the motor

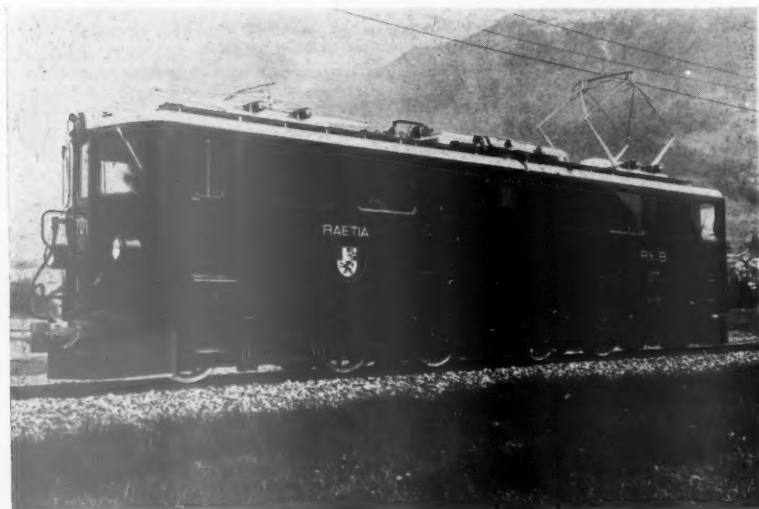
charge can be applied when necessary by operating a switch. An ampere-hour meter on the charger unit operates contacts which automatically reduce the rate to a floating charge when the battery is fully up. Standby lighting is available in the locomotive from the battery. Battery operation is also used for a small auxiliary compressor to provide air for the air-blast circuit breaker when the locomotive is brought into service and the reservoir may be empty.

Braking

The air braking system for the locomotive and train includes an auxiliary air valve which is a characteristic
(Continued on page 135)

Twelve-Wheel Single-Phase 2,400-h.p. Locomotives

Articulated design for heavily graded and sharply curved metre-gauge Swiss line



Rhaetian articulated 2,400-h.p. Bo-Bo-Bo type single-phase locomotive for the Rhaetian Railway, Switzerland

THE main network of the Rhaetian Railway, which practically throughout traverses mountainous country, covers about 186 route miles, all metre gauge. Between Chur and St. Moritz there are long gradients of 1 in 30,

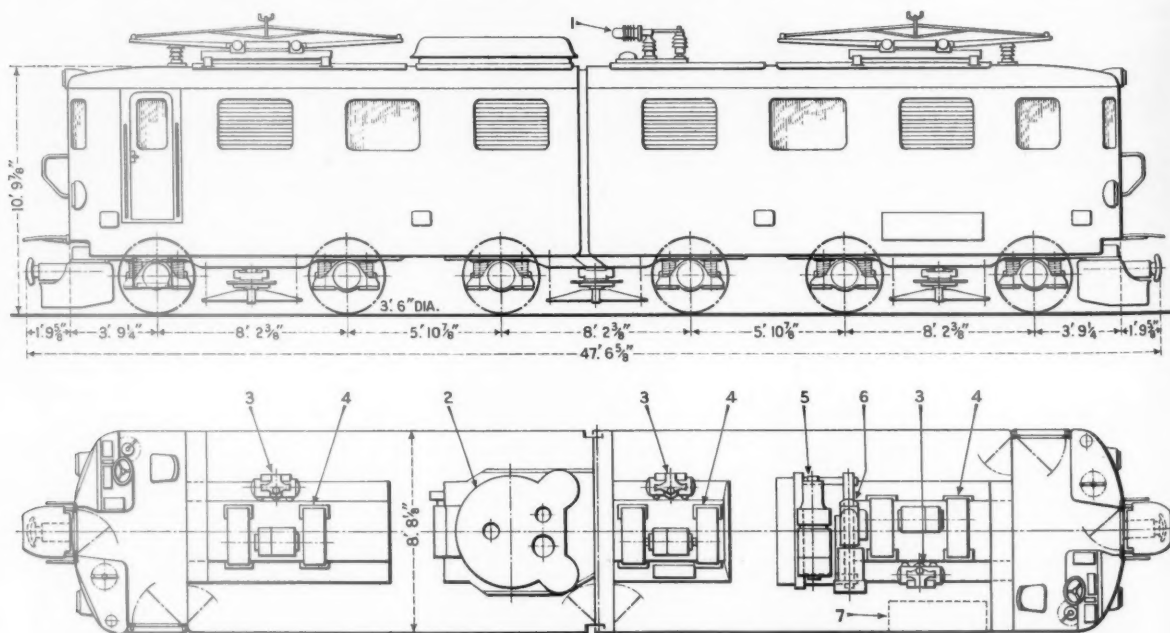
with curves of 22 ch. radius; between Landquart and Davos there are 1 in 22 gradients.

The increase in the traffic, especially that arising this summer from the transport for the new generating station

at Bergell, being constructed for the city of Zürich, amounting to some 1,000 tonnes a day, rendered necessary more powerful locomotives. The question was thoroughly investigated and the possibility of using the "Ge 4/4" class locomotives in double heading was considered. The final decision was in favour of a 12-wheel design of about 2,400 h.p. In view of the special conditions on the line the Swiss Locomotive & Machine Works, Winterthur, designed a locomotive with three four-wheel bogies, and a Bo-Bo-Bo wheel arrangement.

The body was divided into two sections coupled by a link connection permitting them to move vertically but not horizontally with respect to each other. This affords the entire assembly sufficient length to obtain smooth running on straight track. Travel round curves is smooth because of the three bogies and the transverse coupling arrangement referred to below. All axles are equally loaded statically, which is very favourable for adhesion.

The outer, or end, bogies were taken unaltered from the present "Ge 4/4" design; the centre one differs little from them. Driving motors, transmission, and axles are in accordance with the standards followed in the "Ge 4/4" class. This makes for simplicity of maintenance. The electrical equip-



General arrangement and layout of SLM Bo-Bo-Bo 2,400-h.p. electric locomotive

- 1 High-speed pneumatic cut-out
- 2 Transformer with regulating switch and oil pump

- 3 Reversing switch
- 4 Ventilating set
- 5 Vacuum exhaustor

- 6 Compressor set
- 7 Battery

ment, which was designed by the Brown Boveri and Oerlikon companies in consultation, had to be adapted to the new conceptions embodied in the design.

The requirements laid down by the railway management were for a locomotive to haul 250 tonnes on a 1 in 30 gradient and 190 tonnes on one of 1 in 22 at 29 m.p.h., load on the level was to be 400 tonnes.

Leading particulars are:—

	ft. in.
Length over buffers	47 8
Diameter of driving wheels ..	3 6½
Bogie wheelbase	8 2½
Total wheelbase	36 5½
Distance between bogie centres ..	28 2½
One-hr. rating	2,400 h.p. at 29 m.p.h.
One-hr. tractive effort	30,140 lb.
Continuous rating	2,040 h.p. at 31 m.p.h.
Tractive effort at continuous rating ..	23,540 lb.
Maximum starting tractive effort ..	47,960 lb.
Weight of mechanical portion, without driving mechanism, vacuum pump and air compressor	35 tonnes
Weight of electrical portion, with driving mechanism, vacuum pump and air compressor	30 tonnes
Weight in working order	65 tonnes

Mechanical Portion

The bogie is of the Winterthur type. The axleboxes, which have SRO type swing roller bearings, have SLM type pin guides with continuous lubrication. When running round curves the centre bogie moves sideways, partly with the aid of a rather longer pendulum suspension in combination with a system of links and partly with the help of slide face bearings. The two outer bogies are connected across the centre one with a new form of transverse coupling, partly visible in the illustration below, to give favourable setting,

with a small running on angle and guiding force, and resultant low level of wheel flange wear. The centre bogie becomes at the same time correctly set to the curve.

Body Structure

The body consists of two halves connected by a link or hinge arrangement; these halves are complete in themselves and as far as possible identical. Except for certain indicating instruments the layout of the driving cab corresponds with that of the "Ge 4/4" class. Access is through a side door adjoining the controls.

Braking

Each bogie has eight brake blocks with actuating gear of normal type, with two brake cylinders over each outer bogie mounted on the bridgepiece.

A hand brake is operable from either cab and works on the same three axles as does the air brake. The rotary vacuum pump is of VL20 Winterthur pattern, with theoretical exhausting capacity of about 8,600 cu. ft. per hr. (about 144 cu. ft. per min.) at 1,450 r.p.m.; the compressor, of Oerlikon type, has an intake of 30 cu. ft. per min. and gives a pressure of eight atmospheres (118 lb. per sq. in.).

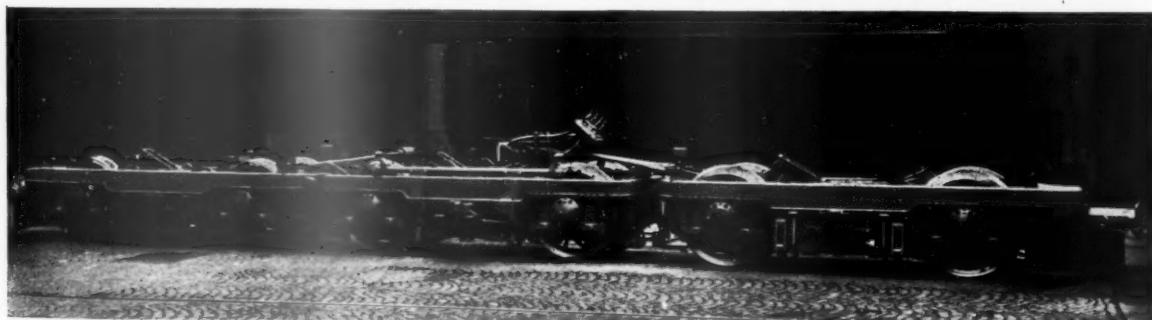
Two externally ventilated single-phase series motors, each 400 h.p. hourly rating, are mounted on each bogie with the Brown Boveri spring drive mechanism. Current is transmitted to the main transformer through two air-operated pantographs, and



Interior of cab, showing control panel with indicating instruments, also brake valve, air and vacuum gauges

pneumatically actuated main cut-out. The transformer has radial fins and external ventilation. All six motors are connected in parallel via the control mechanism to the transformerappings.

To save weight the high-voltage type of control used in the "Ge 4/4" class is replaced by low voltage, with 28 running and 15 braking positions or notches. A separate low-voltage winding givesappings at 140 and 230 V. for auxiliary equipment, while control circuits are fed from a 60 a.h. accumulator battery at 36 V.; this battery is kept charged by a converter set.



Bogies, showing transverse coupling connecting outer trucks across centre

Swedish State Railways 5,500-h.p. Single-Phase Locomotive

(Concluded from page 133)

feature of locomotive working on the iron ore railway. When automatic air brakes were introduced on that line, the driver's brake valve in use did not allow for gradual release of the wagon brakes, and the ore wagons were equipped with an auxiliary brake pipe into which air escapes from the brake cylinders via the triple valve when the brakes are released. The only communication between this auxiliary pipe

and the atmosphere is through an auxiliary brake valve in the locomotive cab, which is controlled by a small handwheel on the opposite side of the driving seat to the normal air valve.

Air supplies for braking and for pneumatically-operated equipment in the locomotive are taken from a high-speed compressor with an output of 70 cu. ft. of free air per min.

Development Project

Consideration is being given to the production of an even more powerful locomotive by adding a third unit with

similar electrical equipment and four driving axles between the two units used at present. In this way a one-hour rating of 8,250 h.p. (by I.E.C. rules) would be obtained, and a possible starting tractive effort of nearly 17,600 lb. The object, if realised, is not to increase the length and weight of the ore trains, which are already at the maximum permitted by their draw-gear, but to reduce liability to wheel-spin in bad weather and the purely mechanical stresses on the driving mechanism by providing a further reserve of tractive effort.

C.T.C. and Remote Control in Denmark

Centralised control, with local panel equipment for emergencies, automatic crossing barriers and other devices are improving traffic operation



Interior of signalbox at Odense showing, on left, C.T.C. panel, with train describer desk for the Nyborg-Tommerup section already in service

THE Danish State Railways are implementing a plan intended to eliminate unremunerative services, reduce the operating costs of others, and accelerate and improve passenger and freight transits. The number of wayside stations is being reduced or their layouts are being simplified, with passing loops lengthened up to 1,170 yd. The latter, however, will be provided less frequently than before and be more conveniently spaced. Diesel working is replacing steam, which enables longer trains to be run and working costs reduced.

It is intended to close private level crossings and replace many public ones by bridges, but many of the latter must remain and are to be equipped with automatically controlled barriers. Points at the ends of stations will be electrically operated, with heaters to ensure free working in winter.

C.T.C.

Plans are in hand for installing track circuiting on a large scale and C.T.C. controls, including the routes between Copenhagen and Kørsør, Nyborg and Fredericia, Lunderskov and Padborg, and Orehoved and Nyköbing. Work on the line to Fredericia, on the island of Fyn, is already complete from Nyborg to Tommerup, with central control panel at Odense. As reported in our issue for June 13, this installation was inspected by members of the Institution of Railway Signal Engineers during their summer convention in May.

The accompanying illustrations show this panel and one situated at an intermediate station. Where there is no

subway, and passengers must cross the lines on the level, illuminated signs, supplemented by loudspeakers as a train approaches, give a warning. Normally both the signalling and road barrier working are remotely controlled or purely automatic; but in an emergency the station supervisor can deal with all movements from his panel, after switching it into circuit, subject to all necessary safeguards.

The C.T.C. controls follow well-

known practice as to traffic operating principles, with the latest circuit developments, train describers and train graph recorders and other facilities on the Swedish Ericsson system, supplied through Dansk Signal Industri A/S, of Copenhagen. The wayside apparatus locations were all pre-wired and tested in the Signal Department shops, ready to go into service immediately on arrival at site, if local circumstances permitted.

Usually station staffs have to deal only with ticket issues, acceptance and delivery of goods, duties arising when trains call, telephone and/or telegraph messages and so on. The new arrangements are working well and already have resulted in economies.

BRITISH STANDARD FOR BRUSHES FOR LOCAL AUTHORITIES AND PUBLIC INSTITUTIONS.—Prepared at the request of a B.S.I. Advisory Committee this British Standard, B.S. 2992:1958, will help to simplify the purchase of painters' and decorators' brushes by large users such as nationalised industries, Government departments, and local authorities. The types of product for which the 44-page illustrated publication specifies dimensions includes: distemper, wash-down, lime wash, paint, varnish, glue and tar brushes, and fitches and lining tools. The specifications were developed in collaboration with brush manufacturers, and are intended to supersede Government Specification TG 11A. It also includes a wide range of brushes not previously standardised. Copies may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1; the price is 8s. 6d.



Wayside station office on Fredericia line, showing local control panel brought into service when required

RAILWAY NEWS SECTION

PERSONAL

Mr. H. K. L. Sethi, General Manager & Chief Engineer of the Ganga Bridge Project, has been appointed by the Indian Railway Board to undertake a study of the advances made in recent years in the science of river training.

Mr. C. G. Harrison, C.B.E., M.Inst.T., M.I.Mech.E., M.I.Loco.E., M.B.I.M., who,

Member of the Malayan Government's Joint Wages Commission in 1947, receiving the special thanks of the Government for his contribution to its work. In 1949-50 he was Principal Assistant to the General Manager, Malayan Railway, and, in 1950-51, served as Motive Power Superintendent. On being appointed Chief Mechanical Engineer in 1952 he reorganised the Mechanical Engineering Department to incorporate Locomotive

appointed General Manager & Chief Engineer, Railway Electrification, with headquarters in Calcutta, and responsibility for electrification on the Eastern and South Eastern Railways.

Mr. Dudley D. Bartlett, F.C.C.S., M.Inst.T., Deputy General Manager, Malayan Railway Administration, who, as recorded in our June 27 issue, has been appointed General Manager, Malayan Rail-



Mr. C. G. Harrison

General Manager, Malayan Railways,
from 1954 to 1958



Mr. D. D. Bartlett

Appointed General Manager,
Malayan Railways

as recorded in June 20 issue, has retired as Chairman & General Manager, Malayan Railway Administration, was born in 1904. He was educated at St. Patrick's Cathedral School, Dublin, and graduated Inter.B.Sc. at London University. He began his railway career as a pupil engineer to Mr. W. H. Morton, M.I.Mech.E., Chief Mechanical Engineer, Great Southern Railways, Ireland, and was later appointed successively Technical Assistant to Works Manager, Junior Assistant (Locomotive), Junior Assistant (Carriage & Wagon), and Assistant Works Manager at Inchicore. He was a member of a number of railway technical commissions and was Vice-President of the Engineering & Scientific Association of Ireland. Mr. Harrison joined the Colonial Engineering Service in 1938, being appointed Assistant Chief Mechanical Engineer, Federated Malaya States Railways. Interned in Sumatra by the Japanese from 1942 to 1945, he administered a large internee hospital as Lay Superintendent. He was appointed a

Operating. He was appointed Deputy General Manager in 1953, and, in 1954, General Manager. Also in the same year he acted for a brief period as member for Transport in the Government of the Federation of Malaya and a Member of the Executive and Legislative Councils. Mr. Harrison was awarded the C.B.E. in 1957. Other appointments held by Mr. Harrison include:— Chairman, Central Electricity Board, Malaya (1955-56); Chairman, Port Swettenham Board; Member, Board of Studies, Faculty of Engineering, University of Malaya; Vice-Chairman (1957) Transport Committee, and Railway Sub-Committee, U.N., E.C.A.F.E.; Member, Advisory Committee for Malaya to the Council of the Institute of Mechanical Engineers. Mr. Harrison is now going to Australia, to take up a senior executive appointment with the Commonwealth Engineering Co. Ltd.

Mr. H. D. Awasty, Director, Civil Engineering, Indian Railway Board, has been

ways, also becomes Chairman of the Railway Board. Mr. Bartlett obtained station and headquarters office experience with the Great Western Railway, which he joined in 1931. He was later appointed a Special Trainee and completed a four-year course of training just before the outbreak of war. He joined the Military Section of the Superintendent of the Line's office in 1939 and, in 1940, was seconded to the Operating Control Section of the Railway Executive Committee. In June 1941, Mr. Bartlett was appointed Junior Assistant to the District Traffic Superintendent, Plymouth, and later Chief Clerk in the Gloucester and Bristol divisions. In 1943 he became Assistant Divisional Superintendent, Gloucester, and was transferred to Bristol in a similar position in 1945, becoming Senior Assistant a year later. During this period Mr. Bartlett served as a member of the Headquarters Rules and Regulations Committee and also undertook a series of lectures on transport at Bristol. In December 1948, he re-

signed his appointment with British Railways to become Assistant Superintendent East African Railways & Harbours. He was first stationed at Dar-es-Salaam and, a year later, was appointed Regional Officer for Tanganyika—a time when the groundnut scheme was in full operation. In 1951 he was transferred to Nairobi and acted as Superintendent of the Line, following Sir Arthur Kirby's appointment as Assistant Commissioner of Transport. The following year he was appointed as Chief Operating Superintendent. Mr. Bartlett left East Africa, in December 1954, to be-

Mr. M. M. Zubair, Chief Engineer, North Western Railway of Pakistan, has retired, he is succeeded by Mr. B. A. Khan, Chief Engineer of the Eastern Bengal Railway.

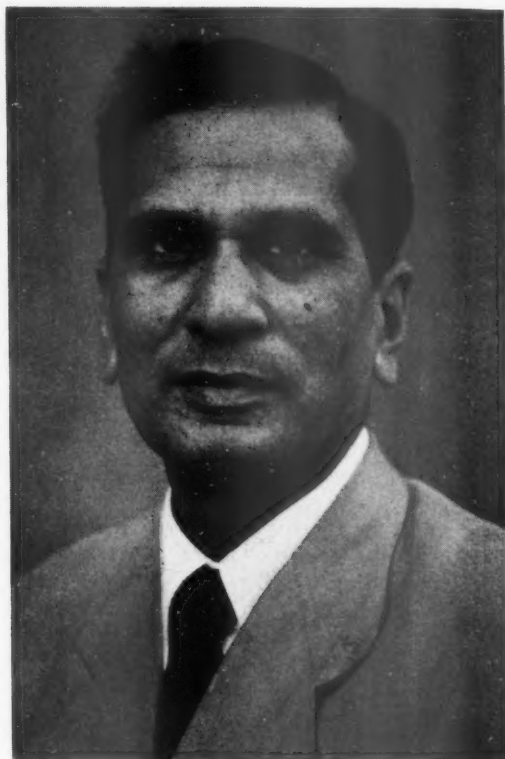
Mr. M. K. Kaul, General Manager, Northern Railway, India, who, as recorded in our June 13 issue, has been appointed General Manager of the Western Railway, India, was born in 1905. He graduated from Government College, Lahore, in 1926, and, after a brief period with the Tata Iron & Steel Company at

of the Railway Sports Control Board and a member of the All India Sports Committee. Mr. Kaul is also President of the Indian Railway Conference Association.

Mr. B. B. Mathur, Senior Deputy General Manager, Northern Railway of India, who, as recorded in our June 6 issue, has been appointed General Manager of that system, was born in 1905. He was educated at Allahabad University, joined the former North Western Railway as Probationer, Transportation, Traffic & Commercial Branch, in 1929. He held



Mr. M. K. Kaul
Appointed General Manager,
Western Railway of India



Mr. B. B. Mathur
Appointed General Manager,
Northern Railway of India

come Deputy General Manager, Malayan Railway, the post he now vacates. During the past three years Mr. Bartlett has been a member of the Penang Port Commission, the Employees Provident Fund Board and the National Joint Labour Advisory Board of the Federation of Malaya. Mr. Bartlett, who is a Brunel Transport Medallist of the London School of Economics, is Chairman, Selangor Branch, Institute of Transport and Hon. Corresponding Member for the Federation of Malaya.

Sir Ralf Emerson, C.I.E., O.B.E., who, as recorded in our July 18 issue, has retired as General Manager, retaining his appointment as Chairman of the Nigerian Railway Corporation, has been appointed a director of the West African Provincial Insurance Co. Ltd. of Nigeria.

Mr. Frank H. Keefe, General Manager, Canadian National Railways, Western Region, is retiring after nearly 50 years' service.

Jamshedpur, joined the B.B. & C.I. Railway in 1927 as Assistant-Superintendent, Stores. During the war he organised railway grainshops and was Controller of Grainshops (Northern Zone) with headquarters at Aimer, where he also served as Chairman of the Municipal Committee. He was Deputy General Manager (Grainshops) from September 1948 to June 1949. In 1949 he was appointed Deputy General Manager (Staff) and was transferred the same year to the Bengal Nagpur Railway as Controller of Stores. In April, 1952, he became Officer on Special Duty (Regrouping), Northern Railway and was appointed its Senior Deputy General Manager in July the same year. He took an important part in the organisation of the Indian Railway Centenary Exhibition in 1953 and was closely associated with the process of integration and progress of the Northern Railway during the first two formative years after the regrouping of railways. Mr. Kaul became General Manager of the Northern Railway in 1954. He is President

various appointments in the Operating Department, in the course of which he dealt with traffic services during the 1935 Quetta Earthquake, and later with heavy war traffic in the Punjab. Immediately following partition, he was in charge of the Transportation and Commercial Departments of the newly-formed Eastern Punjab Railway, and dealt with the heavy movement of refugees between East and West Punjab. In 1948, he became Director, Traffic (Transportation) and subsequently an officer on special duty in connection with regrouping of the railways. On the formation of the Northern Railway in 1952, he was appointed Chief Operating Superintendent. Later that year he received a special assignment with the Expert Working Group on Railway Signalling & Operation, set up by the Economic Commission for Asia and the Far East. In 1954, he was appointed Senior Deputy General Manager, Northern Railway, the position he vacated to take up his new appointment.



Mr. C. Hearnshaw

Appointed District Traffic Superintendent,
Hull, N.E. Region

Mr. C. Hearnshaw, District Operating Superintendent Hull North Eastern Region, British Railways, who, as recorded in our July 4 issue, has been appointed District Traffic Superintendent, Hull, began his railway career with the former Midland Railway in 1922 as junior clerk in the Sheffield district. After experience at various stations he was appointed a Relief Stationmaster in 1929. A period of special service as a Junior Assistant to the District Goods & Passenger Manager at Sheffield was followed by a transfer, in 1937, to the personal staff of the Divisional Operating Superintendent at Derby. In 1946, on the formation of the District Operating Manager's Organisation at Rotherham, he became Assistant to District Operating Manager, and, in 1950, moved to Gloucester as Assistant District Operating Superintendent. In January, 1954, he transferred temporarily to the Birmingham district as Assistant District Operating Superintendent and, in July of that year, became Assistant District Operating Superintendent, Rotherham. He was appointed District Operating Superintendent at Gloucester (Eastgate), in September, 1956, and at Hull a year later. Mr. Hearnshaw's new appointment is a further step in the combination of the Operating and Commercial Departments of the North Eastern Region.

Mr. E. W. Arkle and Mr. A. W. Tait have been appointed to the boards of the Atlantic Steam Navigation Co. Ltd. (which operates the Transport Ferry Service) and its subsidiary, Frank Bustard & Sons Ltd. Mr. Arkle is Director, Traffic Services, London Midland Region, British Railways, and Mr. Tait is Assistant General Manager, Eastern Region.

Mr. G. H. Binnie, Assistant Mechanical Engineer, Nigerian Railway Corporation, has been appointed Chief Mechanical Engineer.

The Institute of Transport announces the award of the following scholarships:—The Henry Spurrier Memorial Scholarship to Mr. A. S. Henderson; the Sir William Chamberlain Memorial Scholarship to Mr. G. I. McKay, Technical Assistant, Manchester Corporation Transport; and the

Silver Jubilee Scholarship to Mr. E. P. Scholtz of the General Manager's Office, South African Railways.

Mr. Q. F. Rhaman, Government Inspector of Pakistan Railways, has retired, he is succeeded by Mr. A. R. Azar, Deputy Chief Engineer (W), North Western Railway, Pakistan.

We regret to record the death on July 12, at the age of 68, of Mr. A. M. Creasey, Assistant District Operating Superintendent London & North Eastern Railway, 1937-1949. Mr. Creasey joined the Midland & Great Northern Joint Railway in 1903. He volunteered for service in the Royal Navy in 1914 and returned to the M. & G.N. Railway in 1919. He was appointed Chief of the Operating Department of the M. & G.N. Railway in 1931. In 1943 he transferred to Liverpool Street, L.N.E.R. and was appointed Chief Signal Inspector (G.N. & G.C. Section). In 1937 he went to Doncaster as Assistant District Operating Superintendent until his retirement in 1949. Mr. Creasey was an Associate of the Institute of Railway Signal Engineers.

We regret to record the death on July 18, of Mr. H. J. Green, O.B.E., M.C., M.I.C.E., M.I.Mech.E., M.Inst., Chief Engineer (Civil), London Passenger Transport Board 1940-43. Mr. Green received his engineering training in America, and he served with the Grand Trunk Pacific Railway as Reconnaissance & Survey Engineer during preliminary work for the route through the Yellowhead Pass of the Rocky Mountains. Immediately before the 1914-18 war, he was appointed Survey & Reconnaissance Engineer for the Pacific Great Eastern Railway, but returned to England shortly afterwards and joined the Royal Fusiliers. Later he was commissioned in the Royal Engineers, and in 1917 he was awarded the Military Cross. After the war he was engaged on harbour and dock construction, and later entered the service of the Metropolitan Railway as Assistant Engineer. Mr. Green was subsequently appointed Acting Chief Civil Engineer. On the formation of the London Passenger Transport Board, he was made Assistant Civil Engineer, and, in 1938, became Assistant to the Chief Engineer. In 1939 he was appointed Assistant Chief Engineer (Civil), and, a year later, Deputy Chief Engineer (Civil). He became Chief Engineer (Civil) in May, 1940. Mr. Green was obliged to relinquish his appointment in November, 1943, on the ground of ill health.

Mr. Laurence J. Culshaw, F.C.A., and Mr. Jocelyn F. T. Nangle, F.C.A., have been appointed auditors of the accounts of the British Transport Commission for the year ending December 31.

Mr. C. A. Browne, Telecommunications Engineer, Western Region, British Railways, has retired after nearly 50 years' service.

Mr. A. Petrie, Assistant to the Chief Commercial Manager (Passenger), Scottish Region, British Railways, has retired after 49 years of railway service.

Mr. C. B. Garrard, General Agent, City of London Office, Canadian Pacific Railway, has retired. He is succeeded by Mr. H. McBride, Assistant General Agent. Mr. K. W. Muir has been appointed Freight Agent in that office.



Mr. C. Birch

Appointed District Traffic Superintendent,
York, N.E. Region

Mr. C. Birch, District Operating Superintendent York, North Eastern Region British Railways, who, as recorded in our July 4 issue, has been appointed District Traffic Superintendent, York, commenced his railway career in 1925 in the District Locomotive Superintendent's Office of the L.N.E.R. at Sheffield. In 1931 he moved to the District Superintendent's Office, Manchester, and, in 1932, he became a Traffic Apprentice, his period of training being spent in north-eastern England. He was appointed Assistant Yardmaster, Stockton and Newport, in 1936; Yardmaster, Blyth, in 1937; and filled posts at Newcastle, Sunderland and Tyne Dock between 1938 and 1940 before becoming Assistant to the District Superintendent, Newcastle, in 1941. In 1943 he became Head of Passenger Train Section, Superintendent's Office, York, and the following year was Head of Freight Train Section. In 1946 he was appointed Traffic Control Officer, Central Traffic Office, Marylebone, and, in 1947, Assistant to Operating Superintendent (Trains), Scottish Area, L.N.E.R. at Edinburgh. He became District Operating Superintendent, at Wakefield, in 1950, at Sunderland in 1953, and at York in 1955. Mr. Birch's new appointment is a further step in the combination of the Operating and Commercial Departments of the North Eastern Region.

Mr. B. Curtis, Senior Engineer, Water Separator Division, Simmonds Aerocessories Ltd., is visiting Turkey and Iran on business.

Mr. K. S. Estlin has been appointed Cables Sales Manager, Siemens Edison Swan Limited. Mr. J. A. E. Trinder succeeds Mr. Estlin as London District Manager.

Mr. A. W. Morrison, Technical Director, Expandite Limited, is on a business visit to the United States of America.

Mr. F. Foster has been appointed Managing Director of Crompton Parkinson (Stud Welding) Limited.

Mr. Charles Cooper has resigned from the board of Graham Firth Steel Products Limited because of other commitments.

NEW EQUIPMENT AND PROCESSES



Multibore Collets for Hydraulic Chucks

A RANGE of Multibore collets, each of which is adjustable to take any dia. of workpiece within its individual limits, has been developed for use with the manufacturer's specially designed hydraulic chucks.

One advantage is the reduction in the number of individual collets needed to cover a wide variety of diameters, because they have a range of over $\frac{1}{4}$ in. The three hydraulic chuck models all accommodate a series of Multibore collets, and between them can handle every diameter between $\frac{1}{8}$ in. and 2 in.

In this way each Multibore can replace at least 10 of the conventional type, and a very small range is stated to be needed to handle all work within the capacity of the chucks.

Because of its even grip, the Multibore locates the workpiece accurately to such a degree that machining can be carried out to finer limits than with ordinary spring collets, it is claimed. There is no danger of marking or damaging the workpiece, and the positive grip can therefore be greater with a consequent elimination of tendency to slip or score. An adjustable rear collet support on the chuck enables

short workpieces to be gripped firmly at the mouth of the collet.

Each consists of a set of precision ground hardened steel jaws radially located around a set of steel springs. The hydraulically-operated steel cone of the chuck compresses the springs and closes up the jaws of the collet, the movement of all these being parallel to the workpiece, thus spreading the grip over the entire bearing surface. All the advantages of a blade-type collet are retained with the added benefit of there being no moving parts to clog. The accompanying photograph shows a collet typical of the range.

The collets and chucks are manufactured by Crawford Collets, Limited, Tower Hill Works, Witney, Oxon, from which company further details may be obtained.

Automatic Feed Water Treatment

A METHOD of applying treatment for feed water of industrial-type boilers has been developed. The principal feature of the system is an automatic dosage pump which injects treatment into boiler feed water.

This unit is of robust, precision construction, and injects a minute quantity of treatment in a preselected proportion to the feed water supplied to the boiler.

The use of these dosage units is stated to ensure that the greatest economy in treatment is made, and, more important to the life and efficiency of the boiler, removes the fallible human element from the system.

Prices which vary with the size of feed pump in use are from £21 14s., and delivery is ex stock. Further details may be obtained from the manufacturer, Houseman & Thompson Limited, D. M. House, Newcastle upon Tyne, 2.

Tape Reading and Numbering Apparatus

TELEGRAPH traffic by modern high-speed punched tape systems has led to the necessity for the numbering of messages. Ideally the numbering should be done automatically, and standard or "routine" traffic should also be available without punching special tapes. To meet this need, a self-contained apparatus with built-in facilities which are claimed to meet all the necessary operational requirements has been developed.

This device known as the Tape Reading, Auto-sending Equipment, Series TAA, consists of two main units. One section incorporates the tape reading heads and all the operator's functional controls; the other, which can be remotely mounted on a standard 19 in. rack, is the associated electronic distributor.

Two operating heads working on a special step-by-step principle are provided. Both heads can be loaded simultaneously and are sequentially switched so that as soon as one tape has been read the other head comes into operation.

In addition to the two heads, the terminal includes an automatic numbering device, a 100-character test message sender

and two 40-character message senders. The electronic distributor, 19 in. by 8½ in. by 3½ in., which weighs 23½ lb., translates the information read by the tape reading heads, or message senders, into telegraph code. The equipment is suitable for operation on 100-150, 200-250 V., 50/60 cycles supplies. The apparatus is seen in the accompanying illustration, the two operating leads being in the foreground.

The apparatus is manufactured by the Automatic Telephone & Electric Co. Ltd., Strowger House, 8, Arundel Street, London, W.C.2.



Mobile Air Compressor

THE Hymatic-Hydrovane 98P100 mobile air compressor has been developed as a small and manoeuvrable unit. For maintenance work on the permanent way its compact dimensions are stated to allow it to be used between tracks if necessary, without its undercarriage. Two impact wrenches or spike drivers, sleeper tampers, rail saws and drills for fishplate holes can be operated from the machine.

With a free-air delivery of 72 cu. ft. per min. at 100 lb. per sq. in., the compressor weighs 588 lb., or 556 lb. without undercarriage. Its dimensions, with undercarriage, are length, 77 in.; height, 41 in.; width 37 in.

It is driven by a Volkswagen flat-four 26-b.h.p. air-cooled petrol engine. An automatic governor is fitted with additional engine speed control which adjusts engine speed to air consumption. The capacity of the fuel tank is 4½ gal. The engine is completely weatherproofed and fitted with a streamlined readily-detachable cowl. Both cowl and fuel tank are of plastic reinforced glass fibre which is more resistant to damage than metal.

The Hymatic-Hydrovane compressor is an oil sealed rotary type with pressure lubrication to all moving parts. Cooling is by centrifugal fan and laminar flow oil cooler. The outlet connections are two ½-in. b.s.p. lever cocks.

Full details of the 98P100 compressor may be obtained from the manufacturer, the Hymatic Engineering Co. Ltd., Redditch, Worcs.



British Electric Traction Co. Ltd.

The warning of the bus strike : optimism for the future : Mr. H. C. Drayton's review

The sixty-second annual general meeting of the British Electric Traction Co. Ltd., was held on July 24 in London.

Mr. H. C. Drayton, Chairman of the company, in the course of his address said:—

Accounts

The Group gross profit for the year is £5,244,000, an increase of £185,000 on the previous year. From this, however, has to be deducted depreciation of £1,128,000, an increase of £266,000 on the previous year, and this increase arises in the main from the depreciation for a full year of the assets of the Canadian company. After deducting auditors' remuneration and interest charges, there is a Group profit for the year before taxation of £3,687,000, a reduction from the previous year of £236,000. I believe the year under review is a passing phase and what might be termed a pause or resting place.

United Kingdom Bus Companies

Last year when I met you we were in the midst of a strike of provincial busmen, involving our various bus undertakings in this country. At that time the Minister of Labour had decided to submit the dispute to the Industrial Disputes Tribunal, and the unions had refused to co-operate and had preferred to call a strike. The Tribunal gave its award which was an increase of 11s. a week on the basic rates. Although the award was binding on both parties, the unions had indicated that they would not accept it if it did not meet with their approval. However, they called off the strike after it had run for nine days, so presumably the award was a generous one. It was the first strike experienced by the provincial bus industry on a national scale since the general strike in 1926. It came at the most difficult time from the point of view of the public, at the height of the holiday season, and many passengers who had booked their holidays by long distance coaches had to cancel and forgo their holidays. A more permanent loss, however, is that many of our regular travellers have adopted other means of transport, rail, their own cars or motorbikes, and have not returned, and may never return, to bus travel.

Less than nine months after the strike, the provincial bus companies received from the unions a further demand for a wage increase and other additional benefits, and negotiations are now taking place. The experience of last year has sounded a serious warning to those engaged in the provincial bus industry. We have lost passengers as a result of the strike. We have also lost more passengers as a result of having to increase fares to meet the higher wages, and, what is more serious, we have found that traffic receipts have fallen despite the higher fares. To meet these increased costs serious consideration has had to be given to our unremunerative route mileage which is approximately 40 per cent. We have found we cannot afford to run so large a proportion of unremunerative services.

Taxation

I have told you of the excessive tax which we have to pay on our fuel oil,

which amounts to 2s. 6d. a gal. used by public service vehicles. As regards our buses, to give you an idea of what we pay and to put our taxation into an understandable form, we have to pay 4-31d. every time one of our buses travels one mile, and I suggest that is too much for a sleeping partner to take who does little or nothing towards earning it. In the last budget there was no reduction, but what is more to the point, we had further severe taxation put upon us. From the time when statutory undertakings, including omnibus companies, were first made liable to profits tax, they have been charged at the lower rate, namely, 3 per cent on all their profits. Now it is proposed to abolish that rate and to replace it by a flat rate of 10 per cent on the whole of our profits. If the Finance Bill becomes law in its present form—and there is every indication it will do so—this extra profits tax, we estimate, will cost our associated omnibus companies about £360,000 more in a full year. One begins to wonder whether we are performing any service to the public at all, or whether we are regarded as parasites and to be taxed on a penal basis with a view to eventually eliminating us. One thing stands out a mile—we certainly have not received any encouragement from the Treasury.

Overseas Interests

During the year our Canadian Company increased its fleet from 1,700 vehicle units to 1,875 units. Our interests in Canada continued to do well until the Fall, when we were hit by the recession, and profits swiftly tailed off. However, this adversity enabled us to re-organise and consolidate our Canadian undertakings and work together much more quickly than if we had gone on being prosperous. As a result of whole-hearted co-operation and working together the business was put on a sounder footing and today is working at a monthly profit.

It is now four years since we started running buses in Kingston, Jamaica. When we started operations there the bus industry was in a chaotic condition. We negotiated a new franchise and we have built up an efficient and reliable service. This entailed sinking much money in new vehicles, garages, etc., which have been profitable both to us and to the people of Kingston by the service we provide. There have been three increases in wages for our work people since we started operation, all of which cost the company money, but which we have been able to absorb without further increasing fares to the public. The Unions are now demanding a fourth increase, but it is so large that there is no basis upon which we can negotiate. Consequently the matter will go to arbitration. We know from experience that demands for increased wages are a part of any business and we, recognising this, accept that position. But what I must voice and bring into the open is that the increases which are awarded under arbitration in Jamaica are made retroactive. This is most unfair and any further increase in costs will mean applying for increased fares. However, we are still of the opinion that with fair treatment we have a profitable business. There is a marked shortage of skilled fitters which the company badly

needs for the maintenance and the expansion of its services.

Our interests in East Africa, that is in Kenya, Tanganyika and Uganda, continue to make steady progress in a quiet way.

Rhodesia United Transport, in which we have a big interest, has had another successful year resulting in a record profit and a moderate increase in dividend. This company is ploughing back a large proportion of its profits with a view to expansion and improving its services to the public. The subsidiary company, formed to undertake the transport contract in connection with the building of the Kariba Dam, to which I referred last year, made a modest contribution to the profits. The Rhodesian company's passenger and freight services continue to forge ahead, although we have many problems which are peculiar to that area, and one of these could be solved if the various governments through whose territories long distance services run would adopt a common code of legislation on transport matters. I was in Rhodesia this year, where I met Mr. John Watts who is Chairman of the company and whose vigorous direction makes us feel satisfied with our participation and gives us confidence that the future will show increased earning capacity.

Other Interests

During the year the confidence we placed in Associated-Rediffusion Limited, that is the independent television company, has been more than fully justified. We realised when we entered this business there would be heavy losses in the initial period of operation, though I must say they were greater than I anticipated. These losses were financed by means of temporary advances, and I am pleased to say that at March 31 we had had substantial repayments. Since the close of the year, the company has either repaid or made arrangements to repay the balance of its indebtedness. We have a major interest in the equity in this company, and in the current year we can look forward to receiving dividends from this source.

In August last year Broadcast Relay Service changed its name to Rediffusion Limited. The company has again had a most successful year and has once more produced record profits.

The results of our subsidiary, Advance Laundries Limited, for the last year have taken a step forward and the company has reported a 28 per cent increase in its Group working profit, and a useful increase in its final dividend. During the year the parent company, that is your company, took up additional ordinary shares to provide for the further development of the company's "Towelmaster" service. I look forward to the results for the current year being quite as good as those for the past year.

Eddison Plant Limited, which hires road-making and contractors' plant, was hit by the heavy reduction in work on road construction following the Suez crisis and the tightening of money, and in consequence had a somewhat less successful year. However, there are signs of revival in this business and if the Government will recognise its obligations in this country for the need of a good road system, we can look forward to this company building up into a very successful busi-

ness. I would like to add the company is now busier than it was a year ago.

The Future

Last year when I met you I mentioned that the company could look forward in the following two or three years, that is this year and next, to reaping the reward from the new businesses we have entered. I see no reason to modify these remarks in any shape or form, and I would like to emphasise that in the current year I expect the income of your company to show a substantial increase, provided there is no setback in our omnibus business in this country or a recession.

The report and accounts were unanimously adopted.

New Dining Room and Lounge Bar at St. Pancras

The B.T.C. Hotels & Catering Services has opened a new dining room and lounge bar at St. Pancras Station (London Midland Region, British Railways). The name of the new premises—"The Shires"—derives from those of the several counties served by the Region from St. Pancras. The new rooms constitute the initial phase of a large-scale modernisation; further improvements will equip St. Pancras with the most up-to-date railway catering facilities in Britain.

"The Shires" replaces the Popular café and refreshment room opposite Platform No. 7 and provides accommodation for about 50. Modernisation has been complete. A new kitchen has been built and an innovation made: a combined counter and waitress service provides drinks and meals ranging from snacks and salads to special grills offered from a tray. The menu includes hors d'œuvres, iced melon, fruits and cheeses, tea, coffee, soft drinks, wines, liqueurs, and a wide range of ales and spirits.

The next stage of reconstruction at St. Pancras will cover the existing grill room, which is to be converted as a cafeteria. The refreshment room adjoining the grill will remain open at present. Later, it will



Another view of "The Shires" at St. Pancras, showing part of dining room and (background) the bar. Note the incorporation of the well-placed serving-hatch in the general design

become a licensed bar, with access to the cafeteria.

Design and Colour Scheme

Contemporary design has been used in the lounge bar, which is finished with sky-blue and lavender Formica. The bar is faced with Indian laurel and brass: Indian laurel also was used in the counter, which is panelled with white ash, has inset shelves, and is based on a terrazzo floor. Six murals representing the Shires flank the bar, to the right of which is an 11 ft. x 7 ft. panel carrying gaily-coloured Italian ceramic tiles. A bright contemporary design covers the curtains.

Ash panelling is continued round the lounge, which is furnished with built-in leather seats, tub chairs, and tile-topped coffee tables. Upholstery is in yellow, red, and bronze.

Dado panelling beneath softly-toned wallpaper decorates the dining room, where there are more built-in seats and chairs. These are upholstered in multi-colour. Curtains are patterned on a dark green background, and electric light fittings are unusual and attractive. The room is air-conditioned.

Ash flush-panelling and a terrazzo floor composed of random marble pieces add interest to the entrance hall, in which there is a small cloakroom.

The powder room has grey and red-dotted wallpaper, doors are faced with lavender Formica, and a yellow Formica shelf is beneath the make-up mirror.

Mechanical washing machines are part of the modern kitchen installations. Staff rooms are well equipped.

The entire work was carried out under the direction of Mr. S. P. Smith, O.B.E., M.I.Mech.E., M.I.M.E., Chief Works Officer, British Transport Hotels & Catering Services, by Mr. N. A. Barber, L.R.I.B.A., Chief Architect to the Service, to the design and under the supervision of Mr. H. H. Horscroft, A.I.A.S., Assistant Architect to the Service.

The main contractor was R. W. Bowman Limited. Sub-contractors were as follow:—

Shop-fitting	Gaskell & Chambers (London) Limited
Terrazzo, wall, and quarry tiling ..	Carter & Co. (London) Ltd.
Steelwork	Moreland, Haynes & Co. Ltd.
Metal windows ..	A. Beanes & Co. Ltd.
Concrete floor ..	Trussed Concrete Steel Co. Ltd.
Carpet (Lounge and Restaurant) ..	Messrs. Hugh Mackay & Company
(Powder Room) ..	Little Britain
Tables (Lounge) ..	J. I. Brooke Limited
(Dining Room) ..	Mitchell (Millbrook) Limited
Table Tiling	Zanelli (London) Limited
Chairs (Lounge) ..	Messrs. Beresford & Hicks
(Dining Room) ..	Hunter & Smallpage Limited
Banquette seating and chair hide ..	Messrs. Connolly Brothers
Curtains (Dining Room, side) ..	Messrs. Sanderson Fabrics
(Dining Room, alcove; dress curtains, Bar side) ..	Sixten & Cassey Limited
Making up and fitting of curtains and carpets ..	Messrs. G. & W. Smith
Light fittings	Messrs. Troughton & Young
Kitchen Equipment ..	W. M. Still & Sons Ltd.
	James Stott & Co. (Engineering) Ltd.
	Messrs. Moorwood
	Benham & Sons Ltd



"The Shires" dining room and lounge bar at St. Pancras. View shows lounge area and door to entrance hall

Colour Light Signalling on the Styal Line

First stage of resignalling for main-line electrification

The first major resignalling changeover in connection with the 25-kV., 50-cycle a.c. electrification scheme was carried out by British Railways, London Midland Region, on July 13, when the 9½-mile section of double-track line between Wilmslow and Slade Lane Junction was completely resignalled.

The new signalling is designed to make possible higher speeds, increase line capacity, and generally facilitate operation. Colour-light signals have replaced mechanically-operated semaphores and both lines have been track-circuited throughout.

The four intermediate signalboxes at Styal, Heald Green, East Didsbury, and Mauldeth Road have been dispensed with, and the siding connections worked from them are operated by electrically controlled ground frames. These connections are normally used for only short periods each day.

For control purposes this section of line is to be divided into two parts; the southern half, from Wilmslow to Gatley comes under the control of the present Wilmslow signalbox and the other is linked with Slade Lane Junction. At a later stage the control of these two sections will be taken over by the new power signalboxes at Wilmslow and Manchester London Road respectively.

Signals

The Styal line will be equipped with 23 three- and four-aspect colour-light signals, of the multi-unit type mounted on steel bracket structures, specially designed and positioned in relation to the overhead traction structures to maintain a clear sight for drivers.

Power for the signal lamps, which are of the 12 V. 24/24 W. tripole type, is taken from the lineside signalling distributor, transformed and rectified at each location. To maintain the signal aspect in the event of a complete power failure or cable fault a Nife standby battery has been installed at each signal.

All signalling circuits are 24 V. d.c. and are carried in unscreened multi-core cables. To limit the maximum voltage which can be induced in the signalling cable conductors from the parallel traction system to 430 V. in the worst fault conditions, all signalling circuits are sectionalised. At each dividing point independent 24-V. transformer/rectifier sets feed in each direction. The 24-V. relays used in these line circuits are immunised against operation by a.c. of a value well in excess of the maximum induced voltage which could appear across their terminals.

Plug-in relays are used in the signalboxes, relay rooms, and lineside locations except for track circuit relays which are shelf-mounted.

Track Circuits

The Styal line is divided into 83 track circuited sections. Two new types of track circuit equipment specially designed to work under high-voltage 50-cycle a.c. traction conditions are employed. The shorter type track circuits up to 500 yd. long, of which there are 59, are of the d.c. rectifier-fed single rail type. The longer track circuits of over 500 yd. are of the 75-cycle a.c. double-rail type with specially designed impedance bonds.

The interlocking and track circuit control functions for the ground frames and their protecting signals are concentrated in four small relay interlockings in separ-

ate buildings at Styal, Heald Green, East Didsbury, and Mauldeth Road. Each of the interlockings is complete and self-contained so far as safety signalling and interlocking circuits are concerned, but instead of being operated from a local panel they are controlled by switches or levers in the signalbox at the end of the section.

Power Supplies

Electrical power for the signalling is obtained from the L.E.A. at Wilmslow and East Didsbury. A 415-V. 50-cycle single phase supply is taken into equipment rooms which house control and distribution switchgear. Lineside distribution is taken from a single 650-V. distributor; the voltage is transformed as necessary at all outside locations, remote relay interlockings, and Wilmslow signalbox.

Signalling and telecommunication cables are run in two channel troughs generally at ground level and on the track side of the traction structures.

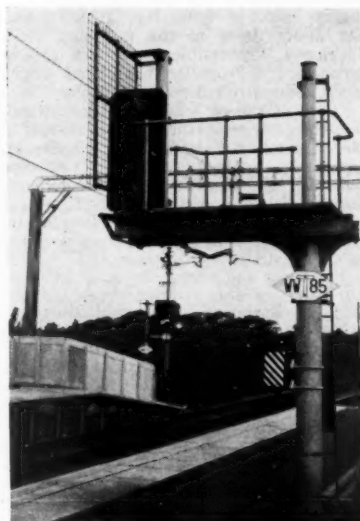
Telephones are located at all running signals to enable trainmen to speak to the signalman if detained at a signal for more than three min. and in an emergency.

The principal contractors were:—

Westronic remote control equipment, track circuiting equipment, and colour-light signals
Telecommunication cables

Westinghouse Brake & Signal Co. Ltd.

British Insulated Cables Ltd.



Four-aspect colour-light bracket signal at Wilmslow

Installation of cable route	United Kingdom Construction Co. Ltd.
Multicore cable	Crompton Parkinson Limited
Plug-in relays	Siemens & General Electric
Signal post telephones ..	Railway Signal Co. Ltd.
Dial selective telephones	Standard Telephones & Cables Limited
	Automatic Telephone & Electric Co. Ltd.

New Car-Ferry Steamer for S.N.C.F.

Large-capacity vessel for cross-Channel short-sea routes: increased manoeuvrability in ports

The Soc. Nationale des Chemins de Fer Français has introduced a cross-Channel car-ferry steamer, the m.v. *Compiègne*, between Dover and Calais. The first ship of her type to be built in France, the *Compiègne* operates the return trip three times daily during the summer, according to traffic requirements, and will also operate during the winter in pool with British Railways car ferries. Passenger fares and rates for cars follow those of other ferries plying between Dover and Boulogne.

With accommodation for 164 cars and 1,000 passengers, the *Compiègne* is the most commodious car-ferry vessels on the cross-Channel short sea routes. Principal characteristics are as follow:—

Length overall	377 ft.
Length between perpendiculars ..	358 ft.
Maximum overall width (with fenders) ..	60 ft. 4 in.
Depth of promenade deck	34 ft. 5 in.
Mean draught	13 ft. 1 in.
Deadweight (tons)	641
Estimated gross tonnage	3,400
Speed attained during trials	Over 21 knots
Service speed	20 knots

There are three car-decks. Cars are driven on the lower deck aft, the height of which is 12 ft. 6 in. and capable of accommodating the largest of motor coaches. Height of each of the two other decks, which are located forward, is 7 ft. 4½ in. Access to these is provided by interior ramps. Movement of cars is "one-way": first on are first off. Ventilation is thorough; exhaust gases are drawn off by air suction pumps and fresh air is blown in.

The embarkation door, designed and constructed by Soc. MacGregor-Comarain, consists of two jointed panels. These fold

upwards to a horizontal position and are controlled by a hydraulic jack. Hydraulic power also operates locking, all operations of which are effected from a single control point. Oil is supplied under pressure by an electro-hydraulic group near the door. The engine's output is 10 h.p. and the pump's constant discharge rate is 14 litres a minute.

Fire precautions are the first to comply with the Convention of London's No. 1 specification for such measures. Metal fireproof curtains on the car decks can seal each section from the rest, and powerful water sprinklers and foam hydrants operate instantaneously.

Lifeboats are constructed from a British fireproof and shock-resistant plastic. Floors, ceilings, and walls of the single-class passenger accommodation are made from fireproof materials.

Accommodation and Equipment

Passenger accommodation includes a large lounge with bar, two wide promenades, and a dining saloon seating 132. There are also (on the Boat Deck) a lounge with panoramic view over the bows of the ship, a snack-bar with "day-light" ceiling and (over the snack-bar) a sun-deck. The extensive use of materials such as Formica, aluminium, and glass gives an impression of light and space.

Propulsion

Propulsion is by two 16-cylinder Vee-bank Pielstick supercharged diesel engines, built by Soc. Générale de Constructions Mécaniques under licence from Soc. des Etudes de Moteurs Thermiques. Each

engine, rated at 4,500 h.p. at 345 r.p.m., has direct drive to the propeller shaft. "Kameva" reversible propellers are incorporated. Propeller pitch and engine speed are controlled direct from the bridge.

Three Gramme 280-kVa. alternators delivering 50-cycle three-phase current at 380 V. provide electric power. These are driven by engines constructed by Soc. Générale de Constructions Mécaniques. Current distribution is by the N.T. system.

Like most cross-Channel vessels, the *Compiègne* is equipped with stern and bow rudders. Additionally, transversal tunnels in the bows and under the waterline contain a propulsion system which exerts a port or starboard transversal thrust as required. This makes for ease in handling when coming alongside or casting off.

In addition to the usual forward steering gear, the vessel is equipped with separate gear aft for stern movement in port. Of the radar equipment provided at each position, a special high-definition installation placed aft permits sighting of near objects.

Design and construction were carried out by Soc. des Chantiers Réunis "Loire-Normandie" in the Grand-Queville shipyard at Rouen under the special supervision of the Bureau Veritas (the French Lloyds).

The Master is Captain Lacoste and the Purser, Monsieur Gagne.

Reservations can be made through the Central Motor Car Booking Office, Victoria Station, British Railways.

Questions in Parliament

Unremunerative Railway Services

Mr. Geoffrey Wilson (Truro—C.) asked the Minister of Transport & Civil Aviation on July 23 whether he had now discussed with the chairmen of the Transport Users' Consultative Committees the B.T.C.'s proposal to withdraw unremunerative rail services from more than 30 lines; and if he would make a statement.

Mr. Harold Watkinson: I met the chairmen on June 24 and informed them that the Government intended to support strongly the Commission plans for eliminating from the railway system those services which are hopelessly uneconomic in modern transport conditions. The railways are no longer a monopolistic organisation with an obligation to provide all sections of the community with a railway service.

The Consultative Committees, when considering proposed withdrawals, will continue to give full opportunity to local interests to express their views and in making their recommendations will continue to take into account the existence of alternative services or the need for them. The Commission is under no obligation to provide an alternative service. Sir Brian Robertson has, nevertheless, assured me that they are willing to co-operate fully with the Committees in exploring how the needs of the public affected by withdrawal can best be met.

Mr. Wilson: While not wishing to do anything to obstruct the railways in removing uneconomic services, may I ask the Minister if he will bear in mind that certain problems may arise in rural areas in connection with rural bus services?

Mr. Watkinson: I am only too conscious of the rural problems of the rural areas, and I had a very useful discussion with all the chairmen of the Consultative Committees recently. I am sure, too, that they are fully aware of the problem. On

the other hand, the Commission has to try to get its finances in order, and therefore we must not stand unduly in its way of cutting its costs.

Mr. Ernest Davies (Enfield E.—Lab.): There are other standards besides that of making the railways pay. It is necessary to maintain a public service. As certain railway services are operated very profitably, must not these be used to keep running services in areas where there are no other adequate transport facilities? Is it not necessary to maintain a public service?

Mr. Watkinson: I do not quite agree. Certainly, the B.T.C. does not advocate removing services where there is some eventual hope of their paying, or providing necessary feeder services to other parts of the railways. What I am not prepared to ask the Commission to do—and I should make this quite plain to the House—is to keep on wholly uneconomic services without regard to its financial position.

Mr. G. R. Strauss (Vauxhall—Lab.): Are there not other public services, such as London Transport and the Post Office, which, in the national interests, run services which are not remunerative. The British Transport Commission should do exactly the same thing, and keep railways going where there is no alternative transport.

Mr. Watkinson: The Consultative Committees are produced by Act of Parliament and rest upon an Act of Parliament, which lays upon them the duty of seeing that, as far as possible, where, for example, branch lines are closed, alternative services are provided. I am quite sure that they will continue to carry out that task, and there may well be ways of doing it; but I must make it plain that the Commission has to get its finances in order. The Commission is being very heavily subsidised by the taxpayer at the present moment, and I think the House should help and not hinder it.

Parliamentary Notes

Railways in Colonial Territories

In the debate on Commonwealth trade and economic aid on July 21, when different forms of British investment and the provision of funds for developing the Colonies were discussed at length, Mr. John Tilney (Liverpool Wavertree—C.) said it seemed to him very much better, wherever possible, and when the sums were not too big, for the United Kingdom to lend the money itself.

Loan for Nigerian Railway

"In this connection," he explained, "we should bear in mind something which has not been sufficiently publicised; that Nigeria, in order to get £10 million from the World Bank for the extension of a railway from the Jos Plateau through the Bornu Province to Maiduguri, went to the World Bank and got the money under the guarantee of Great Britain. I hope in the future, when we give such a guarantee, the actual contract will be signed in this country with a certain amount of publicity, because the result is the same as if this country had pledged its own credit."

Investment in East Africa

Mr. James Johnson (Rugby—Lab.) said the only large surpluses available were in the North American continent. We had

the World Bank. Its chairman, Mr. Eugene Black, had just visited Kenya. He gave the East Africa High Commission £3 million for railways, docks, and harbours, and he said that he would give more in the future. Kenya and East Africa were credit-worthy, never mind what some people thought of Mr. Tom M'boya and Mr. Julius Nyerere. The World Bank felt that Kenya and East Africa were stable places in which it could put money.

Mr. J. Stonehouse (Wednesbury—Lab.) urged, in particular, the construction of roads and railways in the Northern Province of Uganda, where there was much unused land, and also in Tanganyika, and asked who was to pay for those new railways and roads. They would not get private enterprise to provide for them, because there was no money in it. It was up to the Government of those countries to develop their communications, but they could spend money on these projects only if they could raise loans in Britain. Therefore, it was up to the Government here to assist the Colonial Governments to raise the money they need for transport communications.

"There is the example," he added, "in Uganda of the railway line to provide a service up to the copper mines at Kilemb. Not only is the railway drawing the copper from Ruwenzori, but also it has opened up a vast area for peasants who are able now to use the railway to send their crops to the distant markets which before were out of their reach.

Mr. A. G. Bottomley (Chatham and Rochester—Lab.) said there was an insatiable demand in Africa and Asia for ports and communications generally.

Staff and Labour Matters

Reduction in London Bus Services

Leaders of the Transport & General Workers' Union have called a delegate conference for August 1 at which a report will be given on the recent discussions with the London Transport Executive relating to the cuts to be made in services.

The union leaders have told London Transport that they will not co-operate in making the cuts. Measures may be suggested at the delegate conference to demonstrate dissatisfaction. This could take the form of a ban on standing passengers or a public campaign against the cuts.

The busmen contend that the cuts deprive the public of good travelling facilities and are contrary to the statutory obligation of London Transport to provide an adequate service. They also contend that the cuts are contrary to the clause in the strike settlement providing a joint examination of the services having regard to the needs of staff and public and the Executive's financial position.

The union accepts that economies are necessary, but feels that they would be more appropriate in other parts of the undertaking.

The men's leaders have been told that in addition to the cuts in central services it is proposed to discontinue five small country routes on weekdays and 13 on Sundays in the autumn.

London Transport announced that increases on "sub-standard" Underground and bus fares and season ticket rates already foreshadowed will come into effect on August 10.

Contracts and Tenders

Also diesel-electric locomotives for R.E.N.F.E.

Also Products Inc., has received a further order from Renfe for 24 of the Co-Co 1,800 b.h.p. diesel-electric locomotives of the "World" model with a driving cab at each end. These will supplement the 17 units, with single end cab, already working in Spain.

The London Transport Executive has placed a contract with the Gloucester Railway Carriage & Wagon Co. Ltd. for six 30-ton bogie flat wagons and five 20-ton bogie rail wagons. The value of the contract is £39,000 and delivery is expected by December, 1958.

British Railways, North Eastern Region, has placed the following contracts:—

Tubwrights Limited, London: tubular steel floodlighting towers, York Up Marshalling Yards

Consolidated Pneumatic Tool Co. Ltd., Gateshead: 15 1½-in. cap drilling machines, Darlington Loco. Works

Jas. Austin & Sons Ltd., Dewsbury: supply of steelwork, bridge No. 8, Sweet Street, Leeds

W. E. Hargrave Limited, York: heating and hot and cold water services, Holgate Villa Site, York

Dow-Mac (Products) Limited, Stamford: supply and delivery of precast concrete drainage units, East Coast main line

L.C. Abdale (Building Contractors) Limited, Darlington: replacement of 30-ton weighbridge, West Hartlepool Goods Station

Leonard Fairclough Limited, Adlington: earthworks, drainage and water mains, Leeds Neville Hill Diesel Depot

The Southern Region of British Railways has placed the following contracts:—

G. E. Wallis & Sons Ltd., London, W.C.2: reconstruction of Higham Road Bridge

Joseph Westwood & Co. Ltd., London, E.14: construction steelwork at Warminster Station underbridge

A. C. W. Hobman Limited, London, E.C.4: resurfacing and surface dressing of roads, footpaths and station platforms, Brighton district

Dorman Long (Civil Engineering) Limited, Luton: part reconstruction of bridge at Clapham Junction

Simmons & Hawke, Limited, London, S.W.18: structural steelwork for colour light signalling, Clapham Junction to Richmond

C. & T. Painters, Limited, London, N.W.10: renovations to roofs over platforms at Waterloo Station

Winter & King, Limited, London, S.W.20: roof repairs at Clapham Junction Carriage Cleaning Shed

Macartney & Sons, London, S.W.9: renewal of roof glazing at Waterloo Station

Metropolitan Construction Co. Ltd., London, E.C.1: reduction of surfaces, roads and footpaths at Eastleigh Carriage & Wagon Works

Fairfield Shipbuilding Engineering Co. Ltd., Chesham, Mon: extension of footbridge at Dover Marine

Walter Kidde Co. Ltd., Greenford, Middlesex: installation of automatic fire protection at Point Pleasant, Gatwick and Chislehurst Junction Signal Boxes

Joseph Westwood & Co. Ltd., Lon-

don, E.14: reconstruction of Coldharbour Lane Bridge, Brixton

Holloway Bros. (London) Limited, S.W.1: berthing and maintenance depot with ancillary work at Stewarts Lane Depot, Battersea

Johnson Bros. (Aylesford) Limited, Tonbridge, Kent: resurfacing and surface dressing of roads, footpaths and station platforms, Woking district.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Turkey:

1 diesel locomotive for shunting services, with a continuous power of 50 h.p.

590 double-sided steel tipping mine wagons of various capacity

1,200 spare wheels

10,000 kgs. light steel rails

100 pairs of flat fish plates for the rails

500 bolts and nuts for flat fish plates for normal rails of 10 and 12 kilos

15,000 bolts nuts for flat fish plates for normal rails of 10 and 12 kgs. length without head 55 mm.

1,500 tie clips and bolts for rails of 26-25 kg. weight per metre length

200 kgs. rail screw pointed end for wooden sleepers to suit rails of more than 30 kg. per metre weight

100 kgs. dogspikes with full ear head to suit rails of 9 kg. per metre

10,000 kgs. dogspikes with full ear head to suit rails of 14 kg. per metre

The issuing authority is Eti Bank Umum Mudurlugu, Ankara, Turkey. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The closing date is August 8, 1958. The Board of Trade reference is ESB/19151/58/I.C.A.

From Thailand:

1 diesel locomotive, 105/112 b.h.p., 9-12 tonnes.

The issuing authority is the Thai Sugar Organisation. The closing date is September 8, 1958. Tenders should be accompanied with a deposit of Baht. 60,000. The Board of Trade reference is ESB/19040/58.

From India:

1 pit type, multi-rail traverser, with useful length of 65 ft. designed for the reception and transport capacity of 150 tons load, electric motor driven, suitable for 400/440 V. three-phase 50 cycles a.c. supply, as detailed in specification No. M436/1-Loco-11/DHD-2-Revised.

The issuing authority is the Director General of Supplies & Disposals. The tender No. is P/SR8/24290-J/IIIA. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is August 19, 1958. The Board of Trade reference is ESB/18948/58.

1,849 superheater element tubes, complete.

The issuing authority is the Director General of Supplies & Disposals. The tender No. is P/SR-7/1807-1/1. Bids should be sent to the Director General

of Supplies & Disposals, Section S.R.7 Shahjahan Road, New Delhi.

The closing date is August 14, 1958. The Board of Trade reference is ESB/18679/58.

From South Africa:

4 electric motor driven, portable lifting jacks, each of not less than 35 ton capacity, complete with controllers and lifting beams. The jacks are required to operate (a) separately with independent control for each jack; and (b) simultaneously, and controlled from a common controller. The jacks are required for lifting the bodies of diesel locomotives to enable the bogies to be removed. Each jack is to be so arranged that they may be easily manoeuvred into position, i.e., the jacks are to be provided with castors, or other suitable arrangement, to allow for movement in all directions.

As a guide to tenderers the lifting jacks should conform approximately to the following dimensions and particulars:— lowest height of jacking pad, 3 ft. 9 in. above rail level; height of lift of jack, not less than 8 ft. 3 in. above rail level; speed of lift, 7 in. per min.; length of lifting beam, 9 ft. 6 in.

Each jack is to be supplied complete in all respects with motor, starter, 50 ft. of flexible electric cable and connections, jacking pads, bearing pads, a lifting beam for each pair of jacks, a master controller and standard equipment.

The issuing authority is the Stores Department, South African Railways. Bids should be sent in sealed envelopes, endorsed "Tender No. F.2987: Jacks" to the Chief Stores Superintendent, P.O. Box 8617, Johannesburg. The closing date is August 6, 1958. The Board of Trade reference is ESB/18433/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

The British Embassy at Mexico City has advised the Board of Trade that Constructora Nacional de Carros del Ferrocarril is working on a project to determine the most convenient way of setting up a forging shop to produce their own axles, figuring on a production of 80 axles a day, each axle weighing about 400 kilograms. A local firm, Servicio Industrial S.A., is interested and would like to be in the position to offer the Mexican railway construction firm the complete machinery units for this job. Ingots will be available locally and no raw material will be imported. The axles are to be forged and rough-turned and then finished in the workshops of Constructora Nacional to ARA standards.

Drawings of the ingots to be used are available for loan on application to the Export Services Branch, Board of Trade. Manufacturers interested in this enquiry, either in the supply of machinery or working in combination with the railway company, should write direct to: Mr. W. Aldford, Servicio Industrial S.A., Apartado 6 Bis, Mexico 1, D.F., and copy their letters to the British Embassy, Commercial Section, Lerma 71, Colonia Cuauhtemoc, Mexico 5, D.F., P.O. Box 96 Bis. The Board of Trade reference is ESB/17727/58.

Notes and News

Institute of Travel Agents.—To prepare those in the travel industry who will take the Institute of Travel Agents examinations next May, courses have been arranged, starting in September, in London, Birmingham, Exeter, Glasgow, Leeds, Manchester, and Newcastle-upon-Tyne, also correspondence courses. Details may be obtained from the Institute of Travel Agents, 10, Mayfair Place, London, W.1.

Wickman Limited Ordinary Dividend.—Wickman Limited, a subsidiary of John Brown & Co. Ltd., is paying an ordinary dividend of 8 per cent, free of tax, for the year ended March 31 on the increased capital of £2,100,000. This compares with 13 per cent, free of tax, on £1,600,000 for 1956-57. Group profits were £365,119 (£465,488), of which £308,022 (£414,928) was attributable to the parent company. The tax charge was £621,310 (£623,297). Preference and ordinary dividends take £184,100 (£224,100).

St. Johns and Dagenham Collisions.—In the editorial article on page 94 of our July 25 issue, in the seventh line of the third paragraph, the word "one" was printed in error in place of "due"; the sentence, therefore, should read: "A.T.C., however, is to be applied to multiple-unit colour-light signals in due course." In the penultimate paragraph, in the eighth line, the latter half of the sentence should read "also that no irregular line clear block indication was produced during the switching out."

August Holiday Arrangements in the Southern Region.—During the August Bank Holiday weekend British Railways, Southern Region, will run 341 additional main-line trains from London to the South and South East coastal resorts and to the West of England. There will be cheap day and half-day fares to most seaside resorts and cheap afternoon tickets from London and the suburbs to the Kent and Surrey

hills. Combined rail and steamer trips can be made to Windsor and other places on the Thames. Cheap tickets are available to the Chatham and Portsmouth for the Royal Navy "at home" days, and to various stations serving race meetings. Over 70 additional Continental boat trains are scheduled. On Bank Holiday Monday there will be no-passport excursions to Boulogne from Victoria and to Dieppe from Newhaven and nearby places in Sussex.

City Rejects Cannon Street Station Plan.—The Court of Common Council of the City of London last week rejected the British Railways, Southern Region, plan for rebuilding Cannon Street Station. The plan provides for a building with a floor space of 300,000 sq. ft. to be built over the station. The City's planning committee had indicated that a 105,000 sq. ft. building might be permitted with a new station, snack bar, and news theatre.

Metropolitan-Vickers Summer School, July, 1958.—During the week beginning July 14, Metropolitan-Vickers Electrical Co. Ltd. held its summer school. This was the seventh in the series of Easter and summer schools which started in 1928. This year's school has been for professors and heads of university departments in engineering, physics and metallurgy, and there was an attendance of over 70 representatives. Besides talks and discussions on a wide variety of subjects, the arrangements included tours of the principal departments of the company and visits to the Metrovick Wythenshawe Transformer Works and the Manchester University Radio Telescope at Jodrell Bank.

Partial Opening of New Notting Hill Gate Station.—Next Sunday passengers will start using for the first time part of the new Notting Hill Gate Station, now being constructed to link up the old Circle and Central Line stations of London Transport on opposite sides of the road. A section of a new 100-ft. long booking hall, built

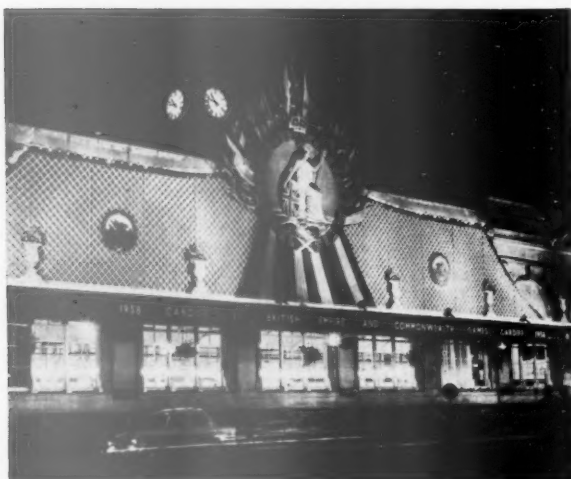
under the street, is being brought into use for Circle and District Line passengers; they will reach it by two new stairway entrances from the pavement on the south side of Notting Hill Gate, and buy their tickets at a temporary booking office in the new hall. The booking hall is to be completed early next year, when it is opened up for Central Line passengers also. The old tube station and lifts on the north side of Notting Hill Gate will be closed and flights of escalators now being installed, leading from the new hall down to the Central Line platforms, will be put into service. The new joint station will save the 2,000,000 passengers a year who interchange there between the Circle and Central Lines, the journey up to street level and cross the busy road junction. The rebuilding of Notting Hill Gate Station is being carried out in conjunction with the L.C.C.'s road widening scheme.

Vickers Limited Interim Dividends.—The directors of Vickers Limited have declared the following dividends in respect of the financial year of 1958: preferred 5 per cent stock, 2½ per cent actual, less income tax; 5 per cent preference stock, 2½ per cent actual, less income tax; and cumulative preference stock, £2 3s. 9d. net per £100 stock. Payment will be made on August 25, 1958.

Closure of Swinton Central Station.—British Railways, Eastern Region, announces that Swinton Central Station on the line from Sheffield Victoria to Doncaster, will be closed from September 15. Passengers will be catered for at Swinton Town, Mexborough, and Kilnhurst Central stations and by the bus services operating in the area. Parcels traffic will be dealt with at Mexborough Station, from which point C. & D. services operate.

G.E.C. Policy and Prospects.—The policy of the General Electric Co. Ltd. is to use the present period of difficult conditions to expedite in all group factories the programme of plant modernisation, and to

British Empire Games : Royal Visit to Wales



Cardiff General Station, with floodlighting of the decorations erected for the 1958 British Empire & Commonwealth Games, held in Cardiff Arms Park last week



Welshpool Station, decorated by the department of the Public Relations & Publicity Officer, Western Region, on the occasion of the visit of the Duke of Edinburgh

overhaul, cheapen and make more effective, all distribution methods, states Mr. L. Gamage, Chairman of the company, in the annual report. This is all the more vital, he continues, in view of the possibilities opened-up by the proposed European Free Trade Area, the conception of which he views as "very necessary to our export trade." He points out that the greater efficiency to be secured both in production and selling will be a gradual process, but should bring better results even should present conditions continue. Any substantial improvements in profits, he adds, "can only come from the betterment of conditions and the lightening of restrictions which at present dog our progress."

New Vehicles for British Road Services.

British Road Services has developed three new vehicles to facilitate the handling of goods in bulk and speed in transit. They are a parcels van with good driving visibility and ease of access to the cab; a slave tractor for manoeuvring semi-trailers within depots; and a rigid eight-wheel vehicle with platform body, quickly demountable in sections with the aid of a fork-lift truck. The standard Leyland "Octopus" 24-ton G.V.W. rigid eight-wheel vehicle, shown in the accompanying illustration, has been fitted with a prototype 24-ft. platform body which can be readily demounted in three 8-ft. sections by a fork truck. The design ensures automatic alignment of the sections on remounting, through male and female pyramids, with a quick-action locking device operated by a detachable crank handle. The demountable sections can be fitted with detachable headboards and sides to divide the load. They can also be assembled as containers. Each vehicle is an experimental prototype at present in the development stage.

Irish Industrialists Inspect Flame Cleaning Equipment.—Some Northern Ireland industrialists recently attended a three-day demonstration of oxy-acetylene flame cleaning equipment held at the Belfast works of British Oxygen Gases Limited. About 90 representatives from engineering works and other undertakings attended. Demonstrations of the equipment, designed to remove mill scale and rust from steel, were given. Afterwards a film on the process was shown and questions were then answered by a member of the sales technical service department of British Oxygen Gases Limited.

J. W. Roberts Limited Change of Address.

—From tomorrow (Saturday) the address of J. W. Roberts Limited will be Chorley New Road, Horwich, Bolton, Lancashire. The telephone No. is Horwich 840; telex No. is 63133. The Ferobestos Department and the General Sales Department will also be accommodated at this address. The Branch Sales Offices in London, Birmingham, Glasgow and Leeds will continue to operate as at present.

Cross-Country Diesel for Aberdeen-Inverness Services.—A three-car "cross-country" diesel train, with miniature buffet in the centre coach, is being operated experimentally for a few weeks between Aberdeen and Inverness. During the period of the experiment, the unit replaces the 8.5 a.m. Aberdeen to Inverness and 12.45 p.m. Inverness to Aberdeen. British Railways, Scottish Region, is arranging by means of a questionnaire to ascertain the view of passengers, particularly those who live or work between



British Road Services Tripad vehicle, showing centre section being removed by a fork-lift truck

Inverness and Aberdeen. A senior representative of British Railways travels on the train daily to discuss the diesel service with passengers and ascertain their reactions.

Mortimer Engineering and Stanhope Machine Tools Combine Sales and Service.—Mortimer Engineering Company and Stanhope Machine Tools Limited have announced that from today (Friday), the two companies co-operate in the sale and servicing of the ranges of machine tools and machine shop equipment for which they hold representations throughout the United Kingdom. Under this agreement both companies continue to operate separately, but to increase the

technical and sales facilities offered to their customers, the closest co-operation between the two companies with the pooling of many present facilities is envisaged. To facilitate this degree of co-operation Stanhope Machine Tools took possession, on July 28, of offices and showrooms at 202, Acton Lane, Harlesden, London, N.W.10, adjacent to the premises of the Mortimer Engineering Company at 204-206, Acton Lane, Harlesden. The telephone No. is Elgar 3834.

Association of Light Alloy Refiners & Smelters Limited.—Alar Limited has formed a combined organisation with the Federation of Light Metal Smelters. The name of the new body is the Association

Locomotive Named "The Territorial Army"

(See last week's issue)



The Duke of Norfolk speaking on July 23 at the naming ceremony at Euston of London Midland Region locomotive No. 70048; on his left are Mr. David Blee, General Manager, L.M. Region, and Major-General W. R. Cox, Director of the Territorial Army

of Light Alloy Refiners & Smelters Limited. The following is the list of members:—Associated Lead Manufacturers Limited, Atkins 'Metals' Limited, B.K.L. Alloys Limited, John Cox & Sons (Metals) Limited, John Dale Limited, Enfield Rolling Mills (Aluminium) Limited, The Eyre Smelting Co. Ltd., J. Frankel (Aluminium) Limited, International Alloys Limited, John E. Moore Limited, Norton Aluminium Products Limited, T. J. Priestman Limited, Wigley Aluminium Limited, Wolverhampton Metal Co. Ltd. The free technical advisory service will continue to be operated from the same address, 3, Albemarle Street, London, W.1.

The Palnut Co. Ltd. Change of Address.—The Palnut Co. Ltd. is moving to new premises: from August 5, the new address will be Palnut Works, 3, Arthur Street, Hove 3, Sussex; tel. Hove 70427.

Canadian Company Formed for Denso Products.—Because of the successful sales of Denso products in the Canadian markets, the manufacturer, Winn & Coales Limited, in collaboration with its main Canadian agents, has recently formed a new company. This is known as Denso of Canada Limited, with its head office at 47, Cranfield Road, Toronto. All enquiries from the North American continent should now be directed to this address.

Reversing Indicators to be fitted to L.T.E. One-man Operated Buses.—London Transport Executive is to fit indicators, on which the word "reversing" will light up in red, on the rear of its one-man operated RF type single-deck buses. The indicators are intended to warn any intending passengers and other road users, to exercise caution until the reversing movement is completed. The one-man operated buses of the L.T.E. are already fitted with a reversing light which comes on when reverse gear is engaged; the reversing indicator bulbs will be wired in parallel with the reversing light so that they are all illuminated while reverse gear is engaged.

Firth Brown Tools Dividend.—The ordinary dividend of Firth Brown Tools Limited, a subsidiary of John Brown & Co. Ltd., for the year ended March 31, is reduced to 9 per cent, from 11½ per cent for the previous year. Group net profits show a reduction of nearly £78,000 at £161,697 after charging depreciation of £145,634 (£153,937) and tax of £229,191 (£331,084). To the profit was added a provision no longer required of £20,000 (£30,000). Preference and ordinary dividends take £94,300 (£117,300) and the directors have set aside £50,000 (£115,000) to reserve. The "carry forward" of the group is raised to £226,051 (from £188,654).

G.E.C. Dividend Reduced.—General conditions affecting the General Electric Co. Ltd. group business, both at home and abroad, continued difficult during the year to March 31, 1958, and although sales rose by 6·1 per cent to £104½ million, group profits, before tax, fell from £6,168,170 to £4,765,143. The total ordinary dividend is reduced from 12½ per cent to 10 per cent. Home organisation sales totalled £77·4 million (£73·8 million) and overseas £27 million (£24·6 million), while exports by the group and associated companies amounted to £23 million (£24·5 million). Research and development ex-

penditure constitutes a heavy charge on profits under present conditions, but is vital for the future, the directors' report points out. There were trade investments of £2·5 million (£2·4 million) and net current assets totalled £56·2 million (£58·1 million), with cash amounting to £7·1 million (£9·2 million) and bank overdraft shown at £506,972 (£401,697). Reserves stand at £37·3 million (£36·8 million).

Railway Stock Market

Growing hopes that international affairs will take a turn for the better have been reflected in a moderate rally in stock markets in which British Funds participated. A rise in Wall Street to the best level this year was attributed mainly to the belief that the recession in the U.S.A. has seen its worst and that there is likely to be an upward swing. It is difficult to say to what extent the better tendency in America has been due to inflationary effects of the Middle East developments or to the view that increased U.S.A. Government expenditure is inevitable and will have a stimulating effect on the economy. A business revival in the U.S.A. would do much to stimulate world trade which has been slowing down in recent months.

Canadian Pacific reflected the upward trend of Wall Street, and at \$52½, compared with \$50 a week ago, were at almost their highest this year: the 4 per cent preference stock gained a point at 53½ and the 4 per cent debentures rose from 65½ to 66½. White Pass shares improved from \$12½ a week ago to \$13½.

Elsewhere, Nyasaland Railways shares have changed hands around 11s. 6d. Dealings around 6 have been recorded in Midland of Western Australia stock. Business ranging from 78 to 80 was shown in West of India Portuguese capital stock.

Among foreign rails, Chilean Northern first debentures have marked up to 40½. Costa Rica ordinary stock transferred at 15½, the first debentures at 75 and the second debentures around 90.

Antofagasta ordinary stock remained at 14½ and the preference stock at 2½; the 5 per cent (Bolivia) debentures changed hands up to 95½, while the 4 per cent perpetual debentures marked 37. In other directions, Mexican Central "A" bearer debentures strengthened from 70 to 70½. San Paulo railway 3s. units have been maintained at 2s. and United of Havana second income stock was maintained at 7.

Among shares of locomotive builders and engineers, recent declines have tended to bring in buyers attracted by the generous yields. Beyer Peacock 5s. shares, which yield over 9 per cent, have improved to 8s. 4½d., compared with 8s. a week ago. On the other hand, North British Locomotive were again out of favour and eased further from 11s. 3d. to 11s. G. D. Peters shares, which are firmly held and do not change hands frequently, were maintained at 21s. 6d. Birmingham Wagon at 15s. 3d. were virtually the same as a week ago, but Gloucester Wagon 10s. shares moved up from 14s. 4½d. to 14s. 7½d. and Wagon Repairs 5s. shares from 10s. 9d. to 11s.

Westinghouse Brake shares, however, eased from 39s. to 37s. 6d. General Electric have rallied strongly—from 32s. to 34s. 3d.—on Mr. Leslie Gamage's annual statement. English Electric also moved higher—from 53s. 3d. to 54s. 9d. and Crompton Parkinson 5s. shares moved up from 10s. 1½d. to 10s. 6d. Elsewhere, Vickers strengthened afresh from 31s. 6d. to 31s. 10½d. John Brown were steady at

25s. 6d. on the results and raising of the dividend from the equivalent of 8·7 per cent to 10 per cent: earnings on the shares were over 23½ per cent. Ruston & Hornsby shares have eased further from 23s. 3d. to 22s. 9d., profit-taking following the results.

In advance of the dividend announcement, the 10s. shares of the Dowty Group rose from 31s. 6d. to 33s. 9d. Vokes 4s. shares strengthened from 15s. to 15s. 3d., but there has been a moderate reaction in T. W. Ward to 78s. Pressed Steel 5s. shares were little changed on balance at 14s. 9d. British Timken have been steady at 45s. 3d., Ransomes & Marles 5s. shares were 11s. 4½d. and Guest Keen rose strongly to 53s. 10½d.

OFFICIAL NOTICES

CIVIL ENGINEERING ESTIMATOR required for the Newport, South Wales, office of Railway and Civil Engineering Contractors. Applicants should have wide experience of tendering for Civil Engineering Contracts and a knowledge of Railway Engineering and Estimating would be considered an advantage. The appointment offers the successful applicant excellent prospects in an expanding company. Applications which will be treated in the strictest confidence, should state age, qualifications, experience in detail, and indication of the salary required. Write: Isca Foundry Company Limited, Newport, Mon.

TRACTION ENGINEER required by National Coal Board's H.Q. Production Department, based at Stanhope Bretry, Nr. Burton-on-Trent. Good technical qualifications and ability to carry out responsible work on a wide variety of traction problems, both on the surface and underground, (throughout the coalfields are required). Appointment (superannuable) according to qualifications and experience within range £1,250-£1,850. Write to Staff Dept. (X1206), N.C.B., Hobart House, Grosvenor Place, London, S.W.1, for application form which should be completed and returned by 13th August, 1958.

CONTRACTS MANAGER required for Railway and Civil Engineering Firm. Applicants must be qualified Civil Engineers experienced in Railway Design and Construction, well versed in Contract procedure and capable of meeting and dealing with the Project Engineers of the Nationalised Industries and with Consultants. The position is an executive one and involves controlling Contracts and Site Personnel in various parts of the country. Initiative and drive are essential, and the appointment offers excellent scope, good salary and incentive bonus to the successful applicant. Applications which will be treated in the strictest confidence should state—Age, qualifications, experience in detail, and indication of salary required.—Write: General Manager, Eagle Construction Co. Limited, East Common Lane, Scunthorpe. Telephone No.: Scunthorpe 4513.

FEDERATION OF MALAYA SIGNAL ENGINEERS

SIGNAL ENGINEERS are required for the Railway Administration on three years contract in the first instance. **QUALIFICATIONS:** Members of the Institution of Railway Signal Engineers and Institution of Electrical Engineers, or Engineering Degree or Diploma as granting exemption from Sections I and II of A.M.I.E.E. with at least 5 years' approved experience. **BASIC SALARY** from \$628 rising to \$1,254 p.m. (£879 to £1,755 p.a.). Commencing salary according to experience. In addition Expatiation and Cost of Living Allowances, substantial gratuity, full pay vacation leave, free passages, free medical attention (except for a small charge for maintenance in hospital). Further details and application forms can be obtained from the Recruitment and Personnel Division, Malaya House, 57 Trafalgar Square, London, W.C.2.

THE Director General of India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of 800 AXLES for W.G. Locos. Forms of tender may be obtained from the above address on or after the 1st August, 1958, at a fee of 10s. which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Thursday, 18th September, 1958. Please quote reference No. 14/58.DB/RLY.2.

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